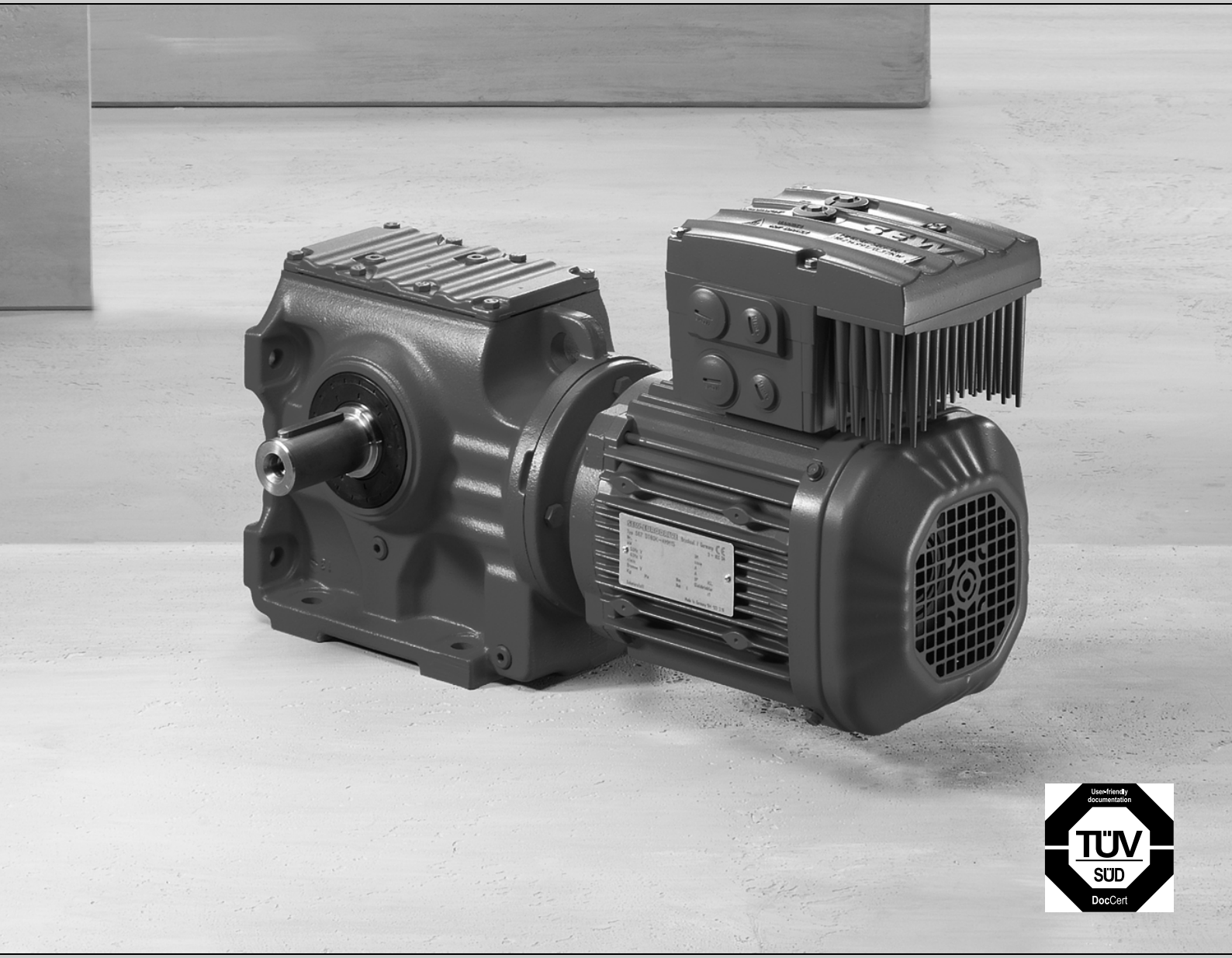
SEW EURODRIVE

Operating Instructions



User-friendly documentation
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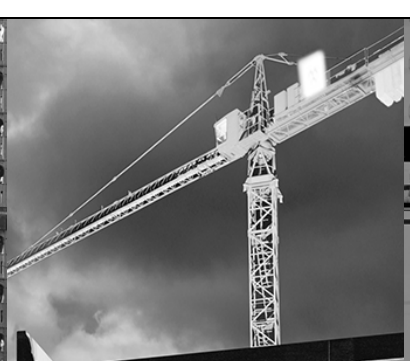
MOVIMOT® MM..D

With DRS/DRE/DRP AC Motor

Edition 12/2010

17000017 / EN



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1 General Information

1.1 How to use this documentation

The documentation is an integral part of the product and contains important information on operation and service. The documentation is written for all employees who assemble, install, startup, and service this product.

The documentation must be accessible and legible. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

1.2 Structure of the safety notes

1.2.1 Meaning of the signal words

The following table shows the grading and meaning of the signal words for safety notes, notes on potential risks of damage to property, and other notes.

Signal word	Meaning	Consequences if disregarded
⚠ **DANGER**	Imminent danger	Severe or fatal injuries
⚠ **WARNING**	Possible dangerous situation	Severe or fatal injuries
⚠ **CAUTION**	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the drive system or its environment
INFORMATION	Useful information or tip: Simplifies the handling of the drive system.	

1.2.2 Structure of the section-related safety notes

Section safety notes do not apply to a specific action, but to several actions pertaining to one subject. The used symbols indicate either a general or a specific hazard.

This is the formal structure of a section safety note:

⚠ SIGNAL WORD

Type and source of danger.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the danger.

1.2.3 Structure of the embedded safety notes

Embedded safety notes are directly integrated in the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

- ⚠ **SIGNAL WORD** Nature and source of hazard.

  Possible consequence(s) if disregarded.

  – Measure(s) to prevent the danger.

1.3 Rights to claim under limited warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the documentation. Read the documentation before you start working with the unit!

1.4 Exclusion of liability

You must comply with the information contained in this documentation to ensure safe operation of MOVIMOT® and to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.

1.5 Copyright

© 2010 – SEW-EURODRIVE. All rights reserved.

Unauthorized duplication, modification, distribution or any other use of the whole or any part of this documentation is strictly prohibited.

1.6 Product names and trademarks

All brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

2 Safety Notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The operator must ensure that the basic safety notes are read and adhered to. Make sure that persons responsible for the plant and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation or if you require further information, please contact SEW-EURODRIVE.

2.1 Preliminary information

The following safety notes are primarily concerned with the use of MOVIMOT® drives. If you use other SEW components, also refer to the safety notes for the respective components in the corresponding documentation.

Please also observe the supplementary safety notes in the individual chapters of this documentation.

2.2 General information

Never install or start up damaged products. Submit a complaint to the shipping company immediately in the event of damage.

During operation, MOVIMOT® drives can have live, bare and movable or rotating parts as well as hot surfaces, depending on their enclosure.

Removing covers without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property. Refer to the documentation for additional information.

2.3 Target group

Only qualified personnel is authorized to install, startup or service the units or correct unit faults (observing IEC 60364 and/or CENELEC HD 384 or DIN VDE 0100 and IEC 60664 or DIN VDE 0110 as well as national accident prevention guidelines).

Qualified personnel in the context of these basic safety notes are persons familiar with installation, assembly, startup and operation of the product who possess the necessary qualifications.

Any activities regarding transportation, storage, operation, and disposal must be carried out by persons who have been instructed appropriately.

2.4 Designated use

MOVIMOT® inverters are components intended for installation in electrical systems or machines.

In case of installation in machines, startup of MOVIMOT® inverters (i.e. start of designated operation) is prohibited until it is determined that the machine meets the requirements stipulated in the Machinery Directive 2006/42/EC.

Startup (i.e. the start of designated use) is only permitted under observance of the EMC directive 2004/108/EC.

MOVIMOT® inverters comply with the regulations of the Low Voltage Directive 2006/95/EC. The standards given in the declaration of conformity are used for the MOVIMOT® inverter.

You must observe the technical data and information on the connection requirements as provided on the nameplate and in the documentation.

2.4.1 Safety functions

The MOVIMOT® inverter may not perform safety functions unless these functions are described and expressly permitted.

2.4.2 Hoist applications

MOVIMOT® inverters are suitable for hoist applications to a limited degree only, see sec. "Additional function 9" (page 78).

MOVIMOT® inverters are not designed for use as a safety device in hoist applications.

2.5 Other applicable documentation

Note also the following documentation:

- "MOVIMOT® Gearmotors" catalog
- "DR.71-225, 315 AC Motors" operating instructions
- Operating instructions for the gear unit (only for MOVIMOT® gearmotors)

You can download or order these publications on the Internet (**http://www.sew-eurodrive.de**, under the heading "Documentation").

2.6 Transportation, storage

You must observe the notes on transportation, storage and proper handling. Comply with the requirements for climatic conditions stated in chapter "Technical Data". Tighten installed eyebolts securely. They are designed for the weight of the MOVIMOT® drive. Do not attach any additional loads. Use suitable, sufficiently rated handling equipment (e.g. rope guides) if required.

2.7 Installation

The units must be installed and cooled according to the regulations and specifications in the corresponding documentation.

Protect the MOVIMOT® inverters from improper strain.

The following applications are prohibited unless the unit is explicitly designed for such use:

- Use in potentially explosive atmospheres.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in non-stationary applications with strong mechanical oscillation and impact loads; see chapter "Technical Data".

2.8 Electrical connection

Observe the applicable national accident prevention guidelines when working on live MOVIMOT® drive inverters (e.g. BGV A3).

Perform electrical installation according to the pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). For any additional information, refer to the applicable documentation.

For notes on EMC compliant installation, such as shielding, grounding, arrangement of filters and routing of lines, refer to chapter "Installation instructions". The manufacturer of the system or machine is responsible for maintaining the limits established by EMC legislation.

Protective measures and protection devices must comply with the regulations in force (e.g. EN 60204 or EN 61800-5-1).

A voltage test according to EN 61800-5-1:2007 chapter 5.2.3.2 is required for the MOVIMOT® drives prior to startup in order to ensure the insulation.

2.9 Safe disconnection

MOVIMOT® inverters meet all requirements for safe disconnection of power and electronic connections in accordance with EN 61800-5-1. All connected circuits must also satisfy the requirements for safe disconnection.

2.10 Operation

Systems with integrated MOVIMOT® inverters must be equipped with additional monitoring and protection devices according to the applicable safety guidelines, such as the law governing technical equipment, accident prevention regulations, etc. Additional protective measures may be necessary for applications with increased potential risk.

Do not touch live components and power connections immediately after separation of the MOVIMOT® inverter from the supply voltage because there may still be some charged capacitors. Wait at least for 1 minute after having switched off the supply voltage.

As soon as supply voltages are present at the MOVIMOT® inverter, the connection box must be closed (i.e. the MOVIMOT® inverter and, if applicable, the connector of the hybrid cable must be connected).

The fact that the status LED and other display elements are no longer illuminated does not indicate that the unit has been disconnected from the supply system and no longer carries any voltage.

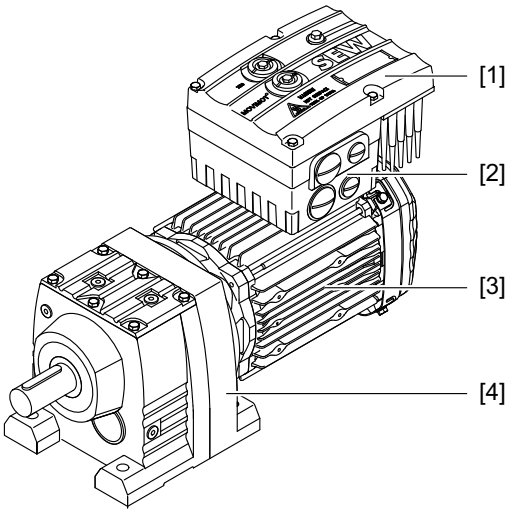
Mechanical blocking or internal safety functions of the unit can cause a motor standstill. Eliminating the cause of the problem or performing a reset may result in the drive restarting automatically. If, for safety reasons, this is not permitted for the driven machine, disconnect the unit from the supply system before correcting the error.

Caution: Danger of burns: The surface temperature of the MOVIMOT® drive and of external options, e.g. the heat sink of the braking resistor, can exceed 60 °C during operation!

3 Unit Design

3.1 MOVIMOT® drive

The following figure shows a MOVIMOT® drive with helical gear unit:



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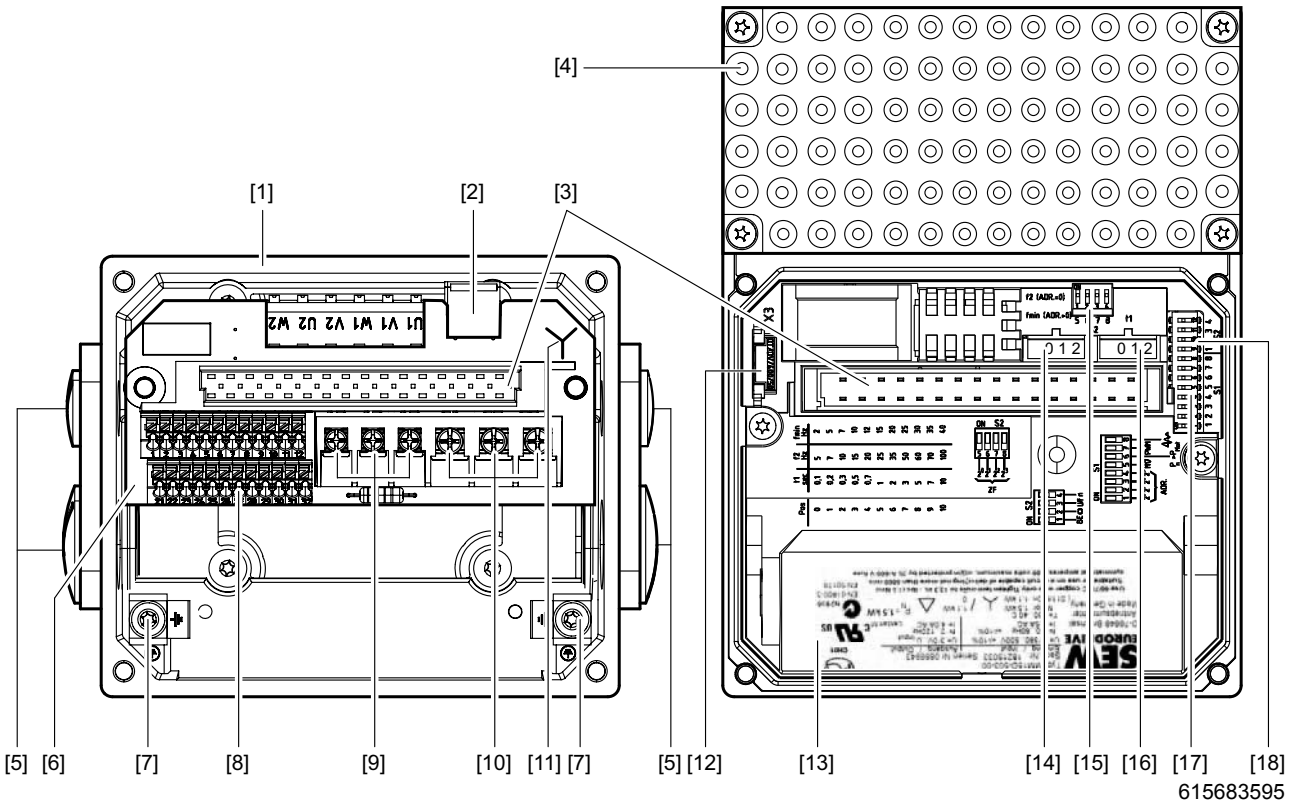
[1] MOVIMOT® inverter
[2] Connection box
[3] Motor
[4] Helical gear unit

A MOVIMOT® drive is a combination of:

- MOVIMOT® inverter
  - Mounted on the motor (see example above)
  - or mounted close to the motor
- Motor (see motor operating instructions)
- Gear unit (optional, see gear unit operating instructions)

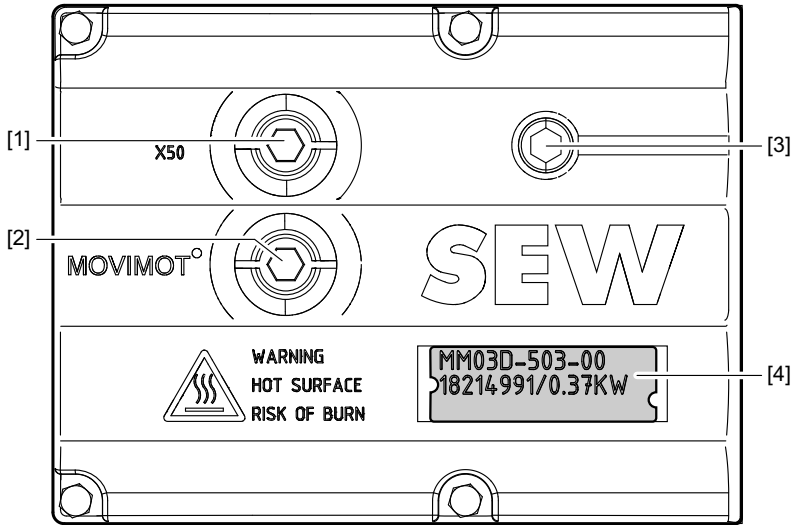
3.2 MOVIMOT® inverter

The following figure shows the connection box and the MOVIMOT® inverter:



[1] Connection box
[2] X10: Plug connector for BEM option
[3] Plug connector for MOVIMOT® inverter
[4] MOVIMOT® inverter with heat sink
[5] Cable glands
[6] Connection unit with terminals
[7] Screw for PE connection ⏚
[8] X5, X6: Electronics terminal strips
[9] X1: Connection for brake coil (motors with brake) or braking resistor (motors without brake)
[10] X1: Supply system connection L1, L2, L3
[11] Connection type identification
[12] Drive-ID module
[13] Nameplate of the MOVIMOT® inverter
[14] Setpoint switch f2 (green)
[15] DIP switches S2/5 – S2/8
[16] Switch t1 for integrator ramp (white)
[17] DIP switches S1/1 – S1/8
[18] DIP switches S2/1 – S2/4

The following figure shows the top of the MOVIMOT® inverter:



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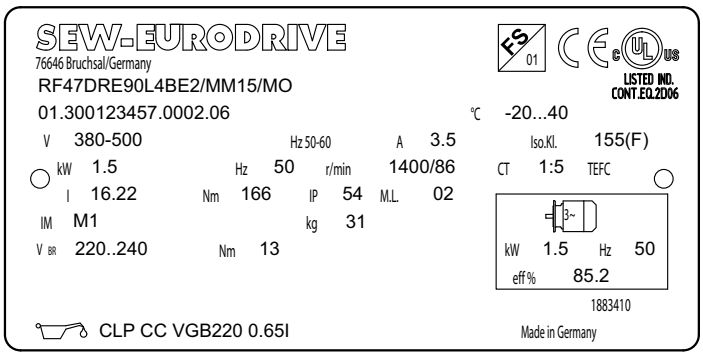
[1] X50: Diagnostics interface with screw plug
[2] Setpoint potentiometer f1 with screw plug
[3] Status LED
[4] Unit identification

3.3 Type designation of MOVIMOT® drive

3.3.1 Nameplate

The following figure gives an example of a nameplate of a MOVIMOT® drive. The nameplate is attached to the motor.



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FS logo

The logos at the top of the nameplate are only there if:

- the motor is manufactured accordingly,
- and contains at least one safety-rated component.

The FS logo on the nameplate is based on the combination of safety-related components that is installed.

3.3.2 Type designation

The following table shows the type designation of the MOVIMOT® drive:

RF 47 DRE 90L4 BE/MM15/MO

- **Additional feature: inverter** 1)
- **MOVIMOT® inverter**
- **Optional design motor (brake)**
- **Size, number of poles on motor**
- **Motor series**
  DRS = DRS motor
  DRE = DRE motor
  DRP = DRP motor
- **Gear unit size**
- **Gear unit series**

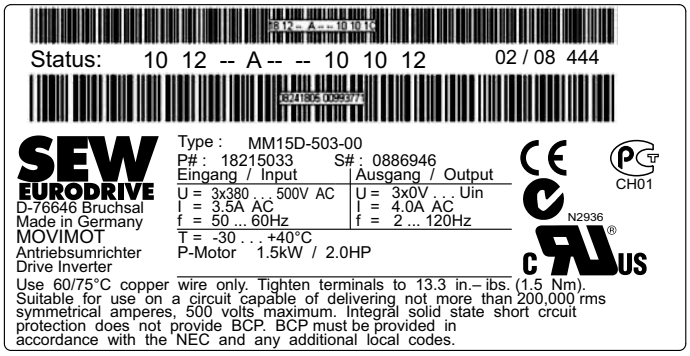
1) The nameplate only displays options installed at the factory.

The available variants are listed in the "MOVIMOT® Gearmotors" catalog.

3.4 Type designation of MOVIMOT® inverter

3.4.1 Nameplate

The following figure gives an example of a nameplate of a MOVIMOT® inverter:


Status: 10 12 -- A -- -- 10 10 12 02 / 08 444
SEW EURODRIVE
D-76646 Bruchsal
Made in Germany
MOVIMOT
Antriebsumrichter
Drive Inverter
Type : MM15D-503-00
P# : 18215033 S# : 0886946
Eingang / Input
U = 3x380 . . . 500V AC
I = 3.5A AC
f = 50 ... 60Hz
Ausgang / Output
U = 3x0V . . . Uin
I = 4.0A AC
f = 2 ... 120Hz
T = -30 . . . +40°C
P-Motor 1.5kW / 2.0HP
CH01
N2936
Use 60/75°C copper wire only. Tighten terminals to 13.3 in.– ibs. (1.5 Nm).
Suitable for use on a circuit capable of delivering not more than 200,000 rms
symmetrical amperes, 500 volts maximum. Integral solid state short crcuit
protection does not provide BCP. BCP must be provided in
accordance with the NEC and any additional local codes.

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3.4.2 Type designation

The following table shows the type designation of the MOVIMOT® inverter:

MM 15 D – 503 – 00

Variant
00 = Standard

Connection type
3 = 3-phase

Supply voltage
50 = AC 380 – 500 V
23 = AC 200 – 240 V

Version D

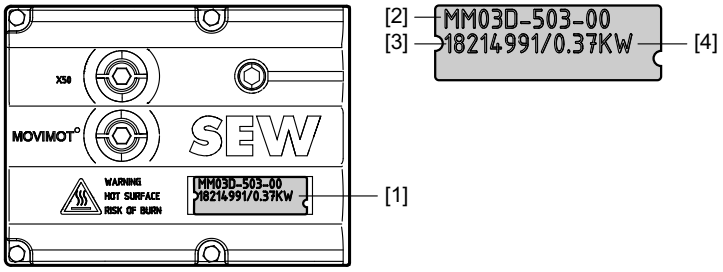
Motor power
15 = 1.5 kW

Unit series
MM = MOVIMOT®

The available variants are listed in the "MOVIMOT® Gearmotors" catalog.

3.4.3 Unit identification

The unit identification [1] on the top of the MOVIMOT® inverter provides information about the inverter type [2], inverter part number [3], unit power [4].



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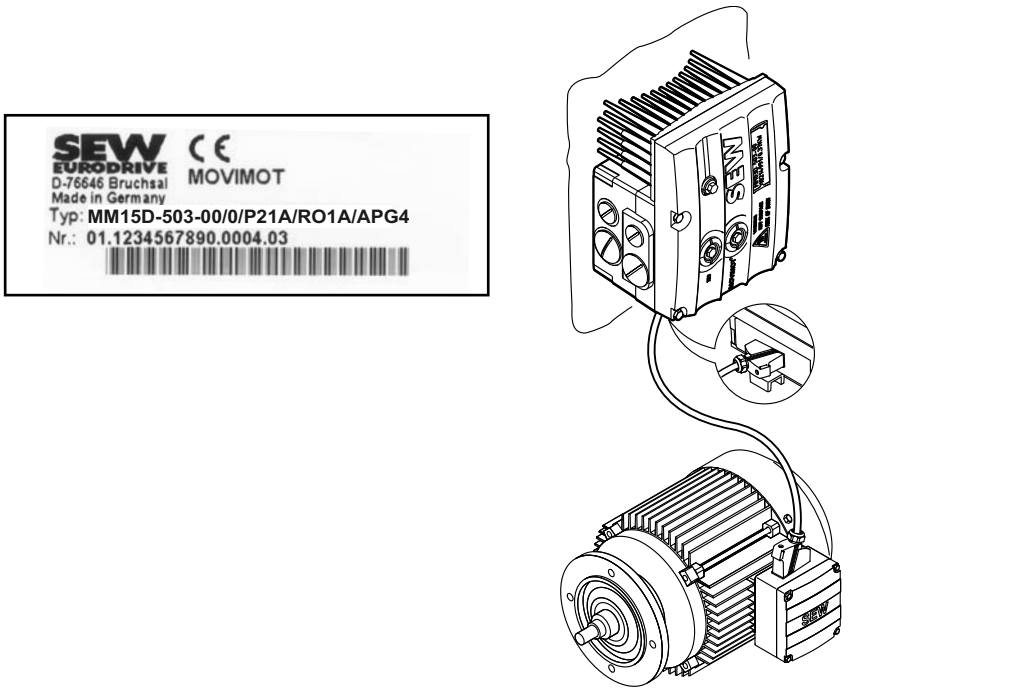
3.5 Type designation of the variant "mounted close to the motor"

3.5.1 Nameplate

The following illustration shows an example of the MOVIMOT® inverter mounted close to the motor with corresponding nameplate:



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3.5.2 Type designation

The following table shows the type designation of a MOVIMOT® inverter mounted close to the motor:

MM15D-503-00/0/P21A/RO1A/APG4

Plug connector
For the connection to the motor

Connection box design

Adapter for mounting close to the motor
21 = Size 1
22 = Size 2

Connection type
0 = 人
1 = △

MOVIMOT® inverter

4 Mechanical Installation

4.1 MOVIMOT® gearmotor installation

4.1.1 General information

- Observe the general safety notes.
- Strictly observe all instructions as to the technical data and the permissible conditions regarding the place of installation.
- Only use the provided attachment options when mounting the MOVIMOT® drive.
- Only use mounting and locking elements that fit into the existing bores, threads and countersinks.

4.1.2 Installation requirements

Make sure that the following requirements are met before you start installing the unit:

- The data on the nameplate of the drive matches the voltage supply system.
- The drive is undamaged (no damage caused by transportation or storage)
- The ambient temperature corresponds to the specifications in chapter "Technical Data". Note that the temperature range of the gear unit may also be restricted (see gear unit operating instructions).
- The MOVIMOT® drive must not be installed under the following harmful ambient conditions:
  - Potentially explosive atmospheres
  - Oils
  - Acids
  - Gases
  - Vapors
  - Radiation
  - etc.
- When the drive is installed in abrasive ambient conditions, protect the output end oil seals against wear.

Installation tolerances

The following tables shows the permitted tolerances of the shaft ends and flanges of the MOVIMOT® drive.

Shaft end	Flanges
Diameter tolerance according to EN 50347 • ISO j6 with Ø ≤ 26 mm • ISO k6 with Ø ≤ 38 mm up to ≤ 48 mm • ISO m6 at Ø > 55 mm • Center bore in accordance with DIN 332, shape DR..	Centering shoulder tolerance in accordance with EN 50347 • ISO j6 with Ø ≤ 250 mm • ISO h6 with Ø > 300 mm

4.1.3 Installing MOVIMOT®

NOTICE

Loss of warranted degree of protection if the MOVIMOT® inverter is installed incorrectly or not at all.

Damage to the MOVIMOT® inverter.

- If you remove the MOVIMOT® inverter from the connection box, you must protect it from moisture and dust.

Observe the following notes for mounting the MOVIMOT® drive:

- Only install the MOVIMOT® drive on a level, low-vibration, and torsionally rigid support structure.
- Observe the mounting position specified on the motor nameplate.
- Thoroughly remove any anti-corrosion agent from the shaft end. Use a commercially available solvent. Do not allow the solvent to penetrate the bearings and shaft seals – this could damage the material.
- Align the motor carefully to avoid placing any unacceptable strain on the motor shafts. Observe the permitted overhung and axial loads specified in the "MOVIMOT® Gearmotors" catalog.
- Do not jolt or hammer the shaft end.
- Use an appropriate cover to prevent objects or fluids from entering motors in vertical mounting positions.
- Ensure sufficient clearance around the unit to allow for adequate cooling. Avoid the drawing in of warm outlet air of other units.
- Balance components that were subsequent mounted to the shaft with a half key (output shafts are balanced with a half key).
- Existing condensation drain holes are sealed with plastic plugs.

  Only open them, if necessary.

  Open condensation drain holes are not permitted. If condensation drain holes are open, higher enclosures are no longer possible.

4.1.4 Installation in damp locations or in the open

Observe the following notes for mounting the MOVIMOT® drive in damp areas or in the open:

- Use suitable cable glands for the cables. Use reducing adapters, if necessary.
- Coat the threads of the cable glands and filler plugs with sealing compound and tighten them properly. Then coat the cable glands again.
- Seal the cable entries properly.
- Clean the sealing faces of the MOVIMOT® inverter well before re-assembly.
- If the corrosion protection coating is damaged, restore the coating.
- Check whether the degree of protection specified on the nameplate is permitted in the ambient conditions on site.

4.2 Installation of MOVIMOT® options

4.2.1 MLU11A / MLU21A / MLG..A option

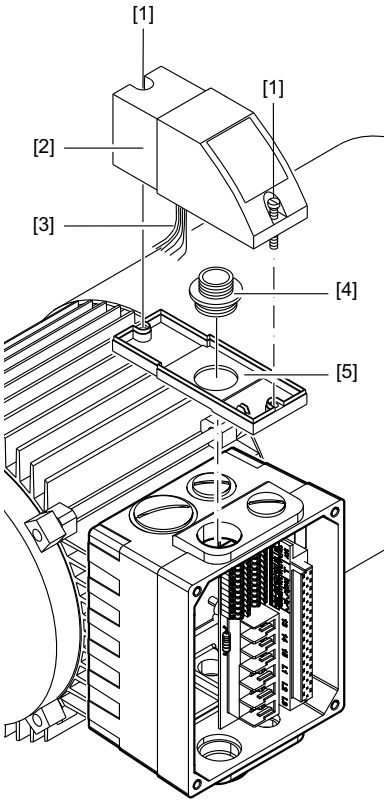
Scope of delivery

- MLU11A / MLU21A / MLG..A upper part [2]
- 2 screws [1]
- Transit bolt [4]
- MLU11A / MLU21A / MLG..A lower part [5]

Installation

1. Remove a screw plug on the MOVIMOT® connection box.
2. Fix the lower part [5] on the MOVIMOT® connection box and fasten it with a transit bolt [4] (tightening torque 2.5 Nm / 22 lb.in).
3. Route the connection cable [3] through the transit bolt [4] into the inside of the MOVIMOT® connection box.
4. Fit the upper part [2] onto the lower part [5] and fasten it with two screws [1] (tightening torque 0.9 – 1.1 Nm / 8 – 10 lb.in).

Mount the option in the following position only:



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For more information about connecting the MLU11A/MLU21A option, refer to sec. "Connection of option MLU11A/MLU21A" (page 42).

For more information about connecting the MLG..A option, refer to sec. "Connection of option MLG..A" (page 43).

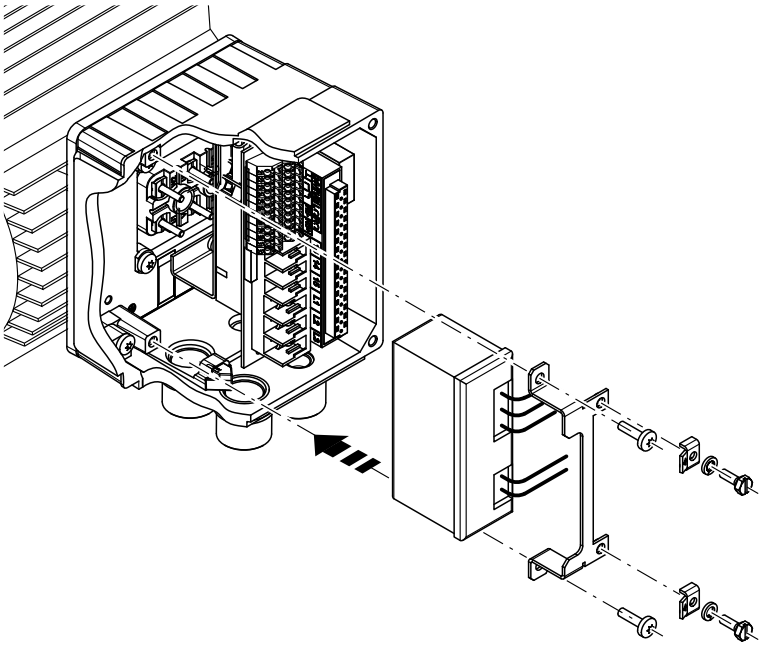
4.2.2 MLU13A option

Option MLU13A is installed in the modular connection box at the factory. If you have any questions about retrofitting the option, please contact the SEW-EURODRIVE service.

INFORMATION

Only install this option in combination with the modular connection box of MOVIMOT® MM03D-503-00 – MM40D-503-00.

The following figure depicts an installation example. The installation depends on the used connection box and on other installed options, if there are any.



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For more information about connecting the MLU13A option, refer to chapter "Connection of option MLU13A" (page 42).

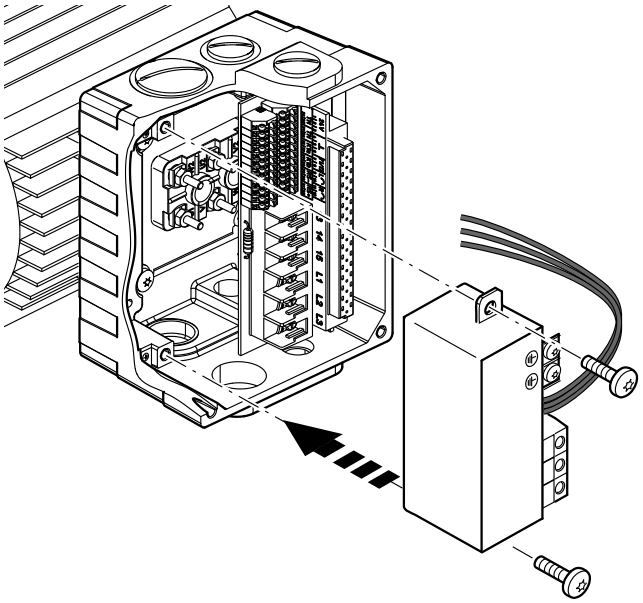
4.2.3 MNF21A option

Option MNF21A is installed in the modular connection box at the factory. If you have any questions about retrofitting the option, please contact the SEW-EURODRIVE service.

INFORMATION

Only install this option in combination with the modular connection box of MOVIMOT® MM03D-503-00 – MM15D-503-00.

The following figure depicts an installation example. The installation depends on the used connection box and on other installed options, if there are any.



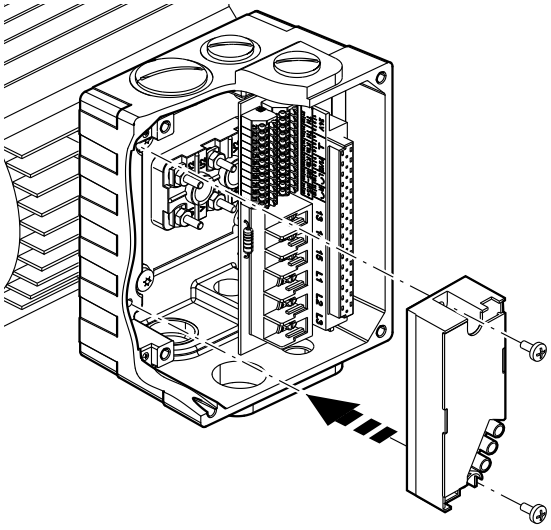
2753184651

For more information about connecting the MNF21A option, refer to chapter "Connecting the MNF21A option" (page 44).

4.2.4 URM/BEM/BES options

The URM, BEM and BES options are installed in the connection box at the factory. If you have any questions about retrofitting the options URM, BEM, or BES, please contact the SEW-EURODRIVE service.

The following figure depicts an installation example. The installation depends on the used connection box and on other installed options, if there are any.



458307467

For more information about connecting the URM option, refer to chapter "Connection of option URM" (page 45).

For more information about connecting the BEM option, refer to chapter "Connection of option BEM" (page 46).

For more information about connecting the BES option, refer to chapter "Connection of option BES" (page 47).

4.2.5 Installation MBG11A

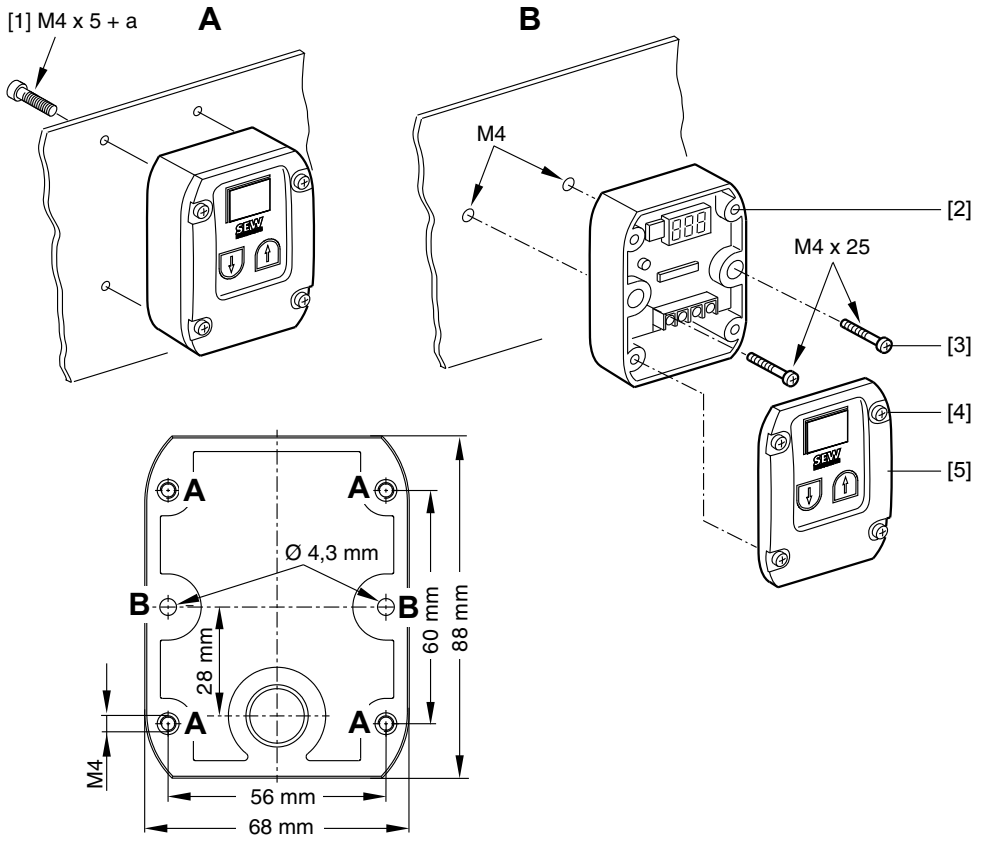
There are two ways to mount option MBG11A to a wall:

A: Mounting from the rear using 4 tapped holes.

(Tightening torque of retaining screw [1]: 1.6 – 2.0 Nm / 14 – 18 lb.in)

B: Mounting from the front using 2 retaining holes

(Tightening torque of retaining screw [3]: 1.6 – 2.0 Nm / 14 – 18 lb.in)



322404747

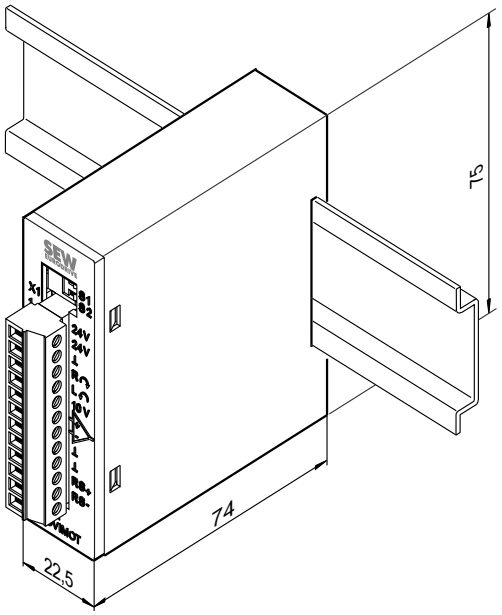
a = Wall thickness
Screws are not included in the scope of delivery.

Fit the upper part [5] onto the lower part [2] and fasten it with two screws [4] (tightening torque 0.3 Nm / 2.6 lb.in).

For more information about connecting the MBG11A option, refer to sec. "Connection of option MBG11A" (page 48).

4.2.6 MWA21A option

Install option MWA21A in the control cabinet on a mounting rail according to EN 50022:

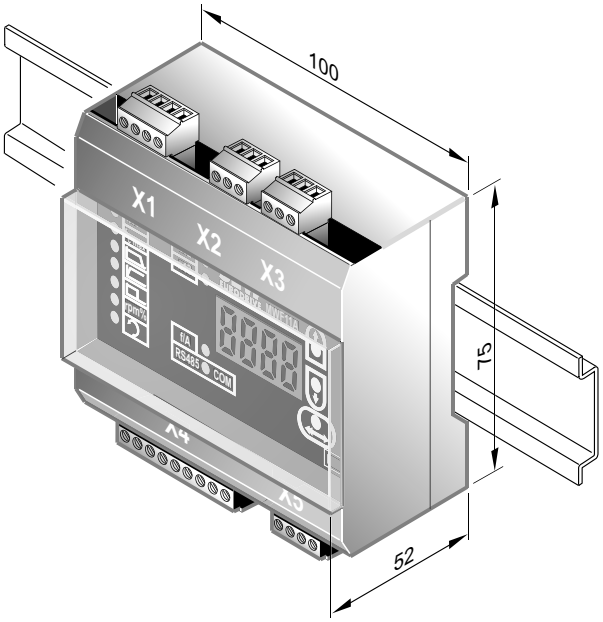


322411915

For more information about connecting the MWA21A option, refer to sec. "Connection of option MWA21A" (page 49).

4.2.7 MWF11A option

Install option MWF11A in the control cabinet on a mounting rail according to EN 50022:

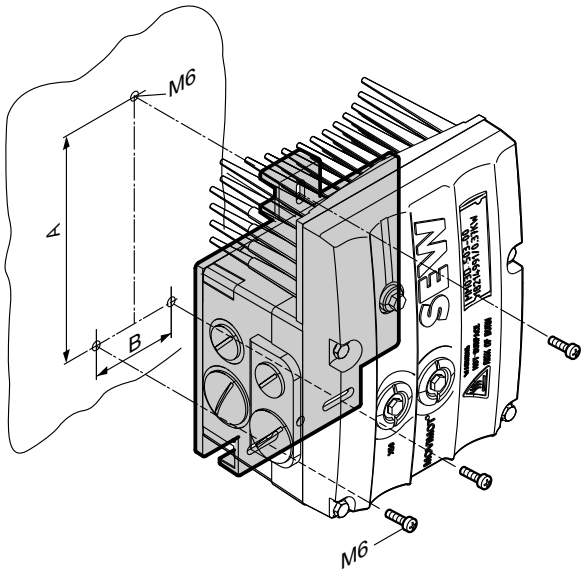


3180221579

For more information about connecting the MWF11A option, refer to chapter "Connection of option MWF11A" (page 50).

4.3 Installation of the MOVIMOT® inverter close to the motor

The following figure shows the mounting dimensions for installing the MOVIMOT® inverter close to the motor:



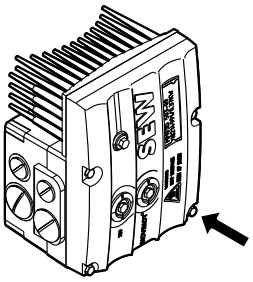
458277771

Size	Type	A	B
1	MM03D503-00 – MM15D-503-00 MM03D233-00 – MM07D-233-00	140 mm	65 mm
2 / 2L	MM22D503-00 – MM40D-503-00 MM11D233-00 – MM22D-233-00	170 mm	65 mm

4.4 Tightening torques

4.4.1 MOVIMOT® inverter

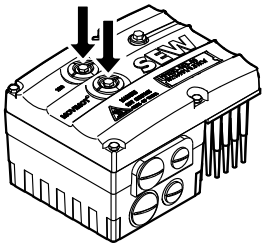
Tighten the screws on the MOVIMOT® inverter using 3.0 Nm (27 lb.in) working diagonally across.



458577931

4.4.2 Screw plugs

Tighten screw plugs of potentiometer f1 and connection X50 using 2.5 Nm (22 lb.in).



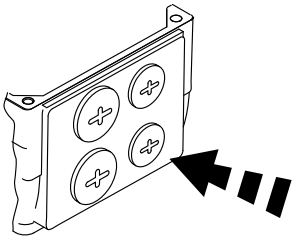
458570379

4.4.3 Cable glands

It is essential to observe the manufacturer's specifications for the cable glands.

4.4.4 Blanking plug cable entries

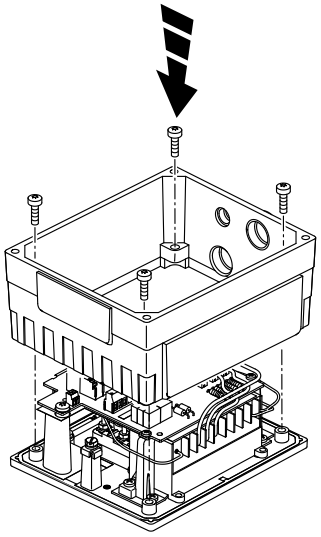
Tighten blanking plug screws with 2.5 Nm (22 lb.in).



322777611

4.4.5 Modular connection box

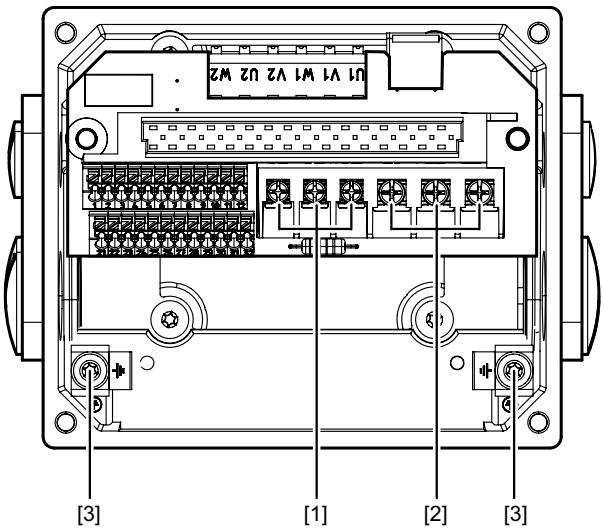
For fastening the connection box on the mounting plate, tighten screws using 3.3 Nm (29 lb.in).



322786187

4.4.6 Tightening torques for terminals

Use the following tightening torques for terminals during installation:



458605067

[1] 0.8 – 1.5 Nm (7 – 13 lb.in)
[2] 1.2 – 1.6 Nm (11 – 14 lb.in)
[3] 2.0 – 2.4 Nm (18 – 21 lb.in)

5 Electrical Installation

5.1 Installation instructions

5.1.1 Supply system connection

- The rated voltage and frequency of the MOVIMOT® inverter must correspond to the data for the power supply system.
- Install line fuses at the beginning of the power supply cable behind the supply bus junction, see F11/F12/F13 in chapter "Connection of MOVIMOT® drive".

  Use only D, D0 or NH fuses, or circuit breakers for F11/F12/F13. Select the fuse size according to the cable cross section.
- SEW-EURODRIVE recommends using earth-leakage monitors with pulse code measuring in voltage supply systems with a non-grounded star point (IT systems). The use of such devices prevents the earth-leakage monitor mis-tripping due to the earth capacitance of the inverter.
- Cable cross section: according to input current I_{mains} for rated power (see chapter "Technical Data").

5.1.2 Permitted cable cross section of MOVIMOT® terminals

Power terminals Observe the permitted cable cross sections for installation:

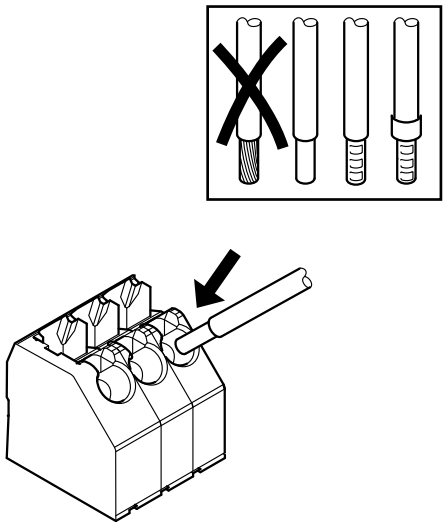
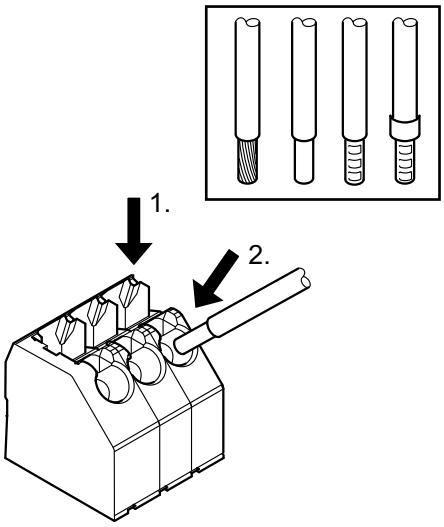
Power terminals	
Cable cross section	1.0 mm^2 - 4.0 mm^2 (2 x 4.0 mm^2) AWG17 – AWG12 (2 x AWG12)
Conductor end sleeves	• **For single assignment:** Only connect single-wire conductors or flexible conductors with conductor end sleeve (DIN 46228, material E-CU) with or without insulating shrouds • **For double assignment:** Only connect flexible conductors with conductor end sleeve (DIN 46228-1, material E-CU) without insulating shrouds • Permitted length of the conductor end sleeve: At least 8 mm

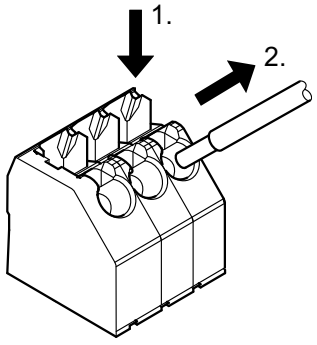
Control terminals Observe the permitted cable cross sections for installation:

Control terminals	
Cable cross section • Single-wire conductor (bare wire) • Flexible conductor (bare litz wire) • Conductor with end sleeve Without insulating shrouds	0.5 mm^2 – 1.0 mm^2 AWG20 – AWG17
• Conductor with end sleeve With insulating shrouds	0.5 mm^2 – 0.75 mm^2 AWG20 – AWG19
Conductor end sleeves	• Only connect single-wire conductors or flexible conductors with or without conductor end sleeve (DIN 46228, material E-CU) • Permitted length of the conductor end sleeve: At least 8 mm

5.1.3 Using the control terminals X5 – X6

Note the following information for actuating the control terminal clamps:

Connecting the conductor Without pushing the actuation button	Connecting the conductor After pressing the activation button
	
The following conductors can be installed directly (without tool) up to two cross-section sizes below the nominal cross section: • Single-wire conductors • Flexible conductors with end sleeves	When connecting the following conductors, you must press the actuation button on top to open the clamping spring: • Untreated, flexible conductors • Conductors with small cross sections that cannot be plugged in directly

Removing the conductor After pressing the activation button


Before removing the conductor, first press the actuation button on top.

5.1.4 Earth-leakage circuit breaker

⚠ WARNING

Electric shock due to incorrect earth-leakage circuit breaker type.

Severe or fatal injuries.

MOVIMOT® can cause direct current in the protective earth. In cases where an earth-leakage circuit breaker is used for protection against direct or indirect contact, only install a type B earth-leakage circuit breaker on the power supply end of the MOVIMOT® inverter.

- Do not use a conventional earth leakage circuit-breaker as a protective device. Universal current-sensitive earth leakage circuit-breakers (tripping current 300 mA) are permitted as a protective device. During normal operation of MOVIMOT® inverter, earth-leakage currents of > 3.5 mA can occur.
- SEW-EURODRIVE recommends that you do not use earth-leakage circuit breakers. However, if an earth-leakage circuit breaker is stipulated for direct or indirect protection against contact, observe the note above in accordance with EN 61800-5-1.

5.1.5 Line contactor

NOTICE

Damage to the MOVIMOT® inverter due to jogging of the K11 line contactor.

Damage to the MOVIMOT® inverter.

- Do not use the K11 input contactor (see wiring diagram (page 36)) for jog mode, but only for switching the inverter on and off. For jog mode, use the the commands "CW / Stop" or "CCW / Stop".
- Observe a minimum switch-off time of 2 s for the line contactor K11.

- Only use a contactor of utilization category AC3 (EN 60947-4-1) as a line contactor.

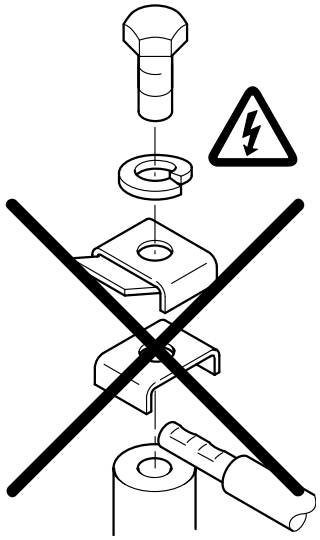
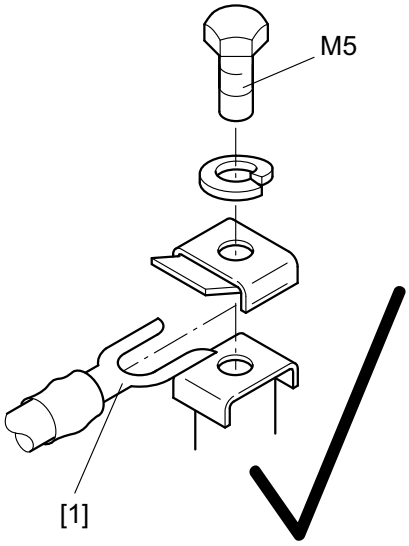
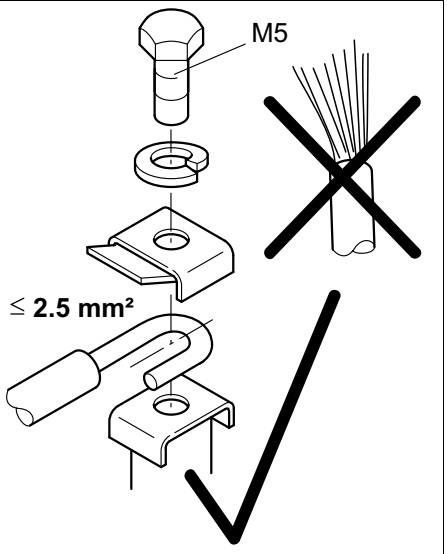
5.1.6 Notes on PE connection

⚠ WARNING

Electric shock due to incorrect connection of PE.

Severe or fatal injuries.

- The permitted tightening torque for the screw is 2.0 – 2.4 Nm (18 – 21 lb.in).
- Observe the following notes regarding PE connection.

Prohibited assembly	Recommendation: Assembly with forked cable lug Permitted for all cross sections	Assembly with solid connecting wire Permitted for cross sections up to max. 2.5 mm²
		

[1] Forked cable lug suitable for M5 PE screws

Earth-leakage currents ≥ 3.5 mA can occur during normal operation. To meet the requirements of EN 61800-5-1, observe the following notes:

- The protective earth (PE) connection must meet the requirements for plants with high earth-leakage currents.
- This usually means
  - installing a PE connection cable with a minimum cross section of 10 mm^2
  - or installing a second PE connection cable in parallel with the original PE connection.

5.1.7 EMC-compliant installation

INFORMATION

This drive system is not designed for operation on a public low voltage supply system that supplies residential areas.

This is a product with restricted availability in accordance with IEC 61800-3. It may cause EMC interference. In this case, it is recommended for the operator to take suitable measures.

For detailed information on EMC compliant installation, refer to the publication "Electromagnetic Compatibility in Drive Engineering" from SEW-EURODRIVE.

With respect to the EMC regulation, frequency inverters cannot be operated as standalone units. Regarding EMC, they can only be evaluated when they are integrated in a drive system. Conformity is declared for a described, CE-typical drive system. These operating instructions contain further information.

5.1.8 Installation above 1000 m asl

MOVIMOT® drives with line voltages of 200 – 240 V or 380 – 500 V, can be also used in altitudes of 1000 – 4000 m above sea level[1)]. Observe the following conditions:

- The nominal continuous power is reduced due to the reduced cooling above 1000 m (see chapter "Technical Data").
- Above 2000 m asl, the air and creeping distances are only sufficient for overvoltage class 2. If the installation calls for overvoltage class 3, you will have to install additional external overvoltage protection to limit overvoltage peaks to 2.5 kV phase-to-phase and phase-to-ground.
- If safe electrical disconnection is required, it must be implemented outside the unit for altitudes of 2000 m above sea level and higher (safe electrical disconnection in accordance with EN 61800-5-1).
- In installation altitudes between 2000 m to 4000 msl, the permitted nominal power supply voltages are reduced as follows:
  - By 6 V per 100 m for MM..D-503-00
  - By 3 V per 100 m for MM..D-233-00

5.1.9 Connecting 24 V supply

- Power the MOVIMOT® inverter either via an external 24 V supply or the MLU..A or MLG..A options.

5.1.10 Binary control

- Connect the required control leads.
- Use shielded cables as control cables and route them separately from supply system cables.

1) The maximum altitude is limited by creeping distances and flameproof components, such as capacitors.

5.1.11 Control via RS-485 interface

The MOVIMOT® drive is controlled via the RS-485 interface by one of the following controllers:

- MOVIFIT® MC
- Fieldbus interfaces MF.. or MQ..
- PLC bus master
- MLG..A option
- MBG11A option
- MWA21A option
- MWF11A option

INFORMATION

- Connect only one bus master to the MOVIMOT® drive.
- Use shielded twisted-pair cables as control cables.
- Route the control cables separately from the power supply cables.

5.1.12 Protection devices

- MOVIMOT® drives are equipped with integrated protection devices against overload. External overload devices are not necessary.

5.1.13

Field wiring power terminals

Note the following points for UL-compliant installation:

- Only use copper conductors with a thermal rating of 60/75 °C.
- The permitted tightening torque of the power terminals is 1.5 Nm (13 lb.in).

Short circuit current rating

Suitable for use on a circuit capable of delivering not more than 200,000 rms symmetrical amperes.

The max. voltage is limited to 500 V.

Branch circuit protection

Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any applicable local codes.

The max. fuse rating is 25 A / 600 V.

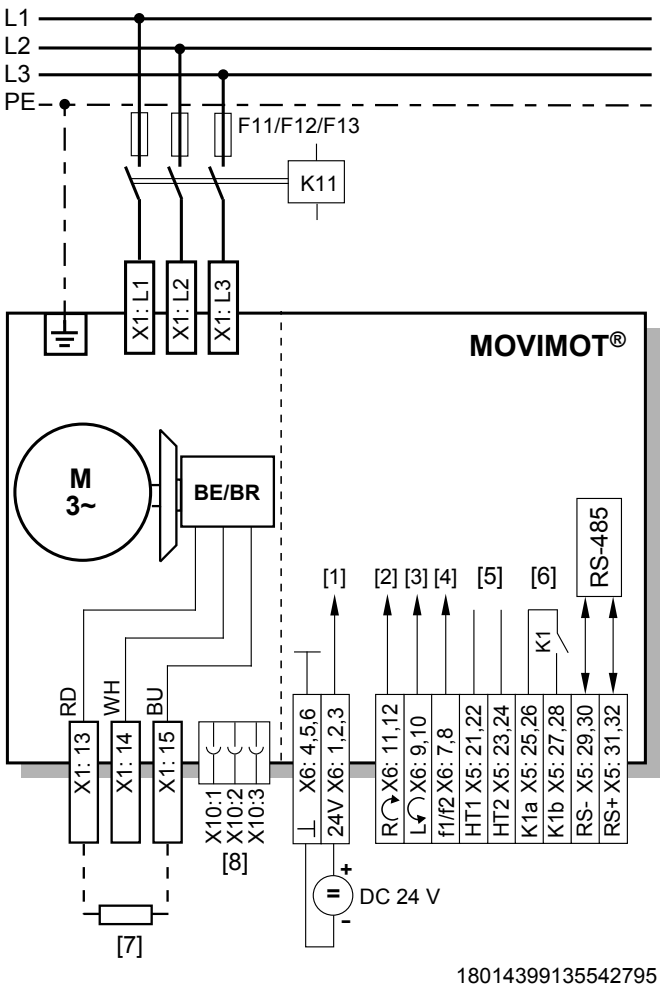
Motor overload protection

MOVIMOT® MM..D is equipped with motor overload protection with a trip current adjusted to 140% of the rated motor current.

Ambient temperature

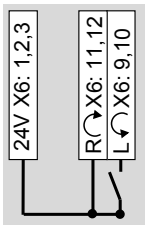
MOVIMOT® MM..D is suitable for an ambient temperature of 40 °C, max. 60 °C with derated output current. To determine the output current rating at higher than 40 °C, the output current should be derated 3.0 % per °C between 40 °C and 60 °C.

5.2 Connection of the MOVIMOT® drive

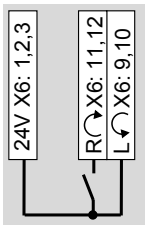


[1] DC 24 V supply
(external or via option MLU..A / MLG..A)
[2] CW/stop
[3] CCW/stop
[4] Setpoint changeover f1/f2
[5] HT1 / HT2: Intermediate terminal for specific wiring diagrams
[6] Ready signal
(contact closed = ready for operation)
[7] BW.. braking resistor
(only for MOVIMOT® drives without mechanical brake)
[8] Plug connector for connecting the options BEM + BES

Functions of the CW/stop and CCW/stop terminals in binary control mode:

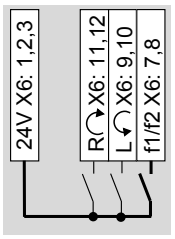


Direction of rotation **CW** active

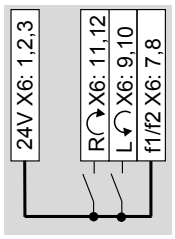


Direction of rotation **CCW** active

Functions of terminals f1/f2:

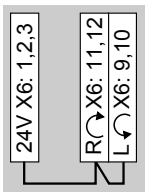


Setpoint **f1** active

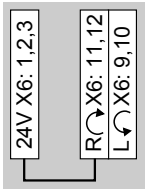


Setpoint **f2** active

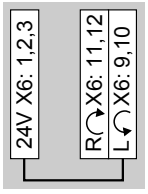
Functions of the CW/stop and CCW/stop terminals with control via RS-485 interface/fieldbus:



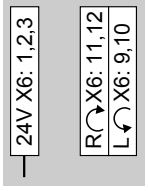
Both directions of rotation are enabled



Only **CW** direction is enabled
Pre-selected setpoints for CCW rotation result in standstill of drive



Only **CCW** operation is enabled
Setpoint specifications for CW operation cause standstill of the drive



Drive is inhibited or is being brought to a standstill

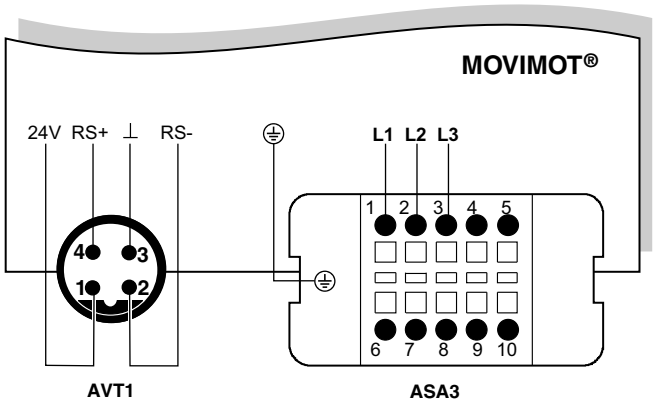
5.3 MOVIMOT® plug connectors

5.3.1 AVT1, ASA3 plug connectors

The following figure shows the assignment of optional AVT1 and ASA3 plug connectors.

Available versions:

- MM../ASA3
- MM../AVT1
- MM../ASA3/AVT1



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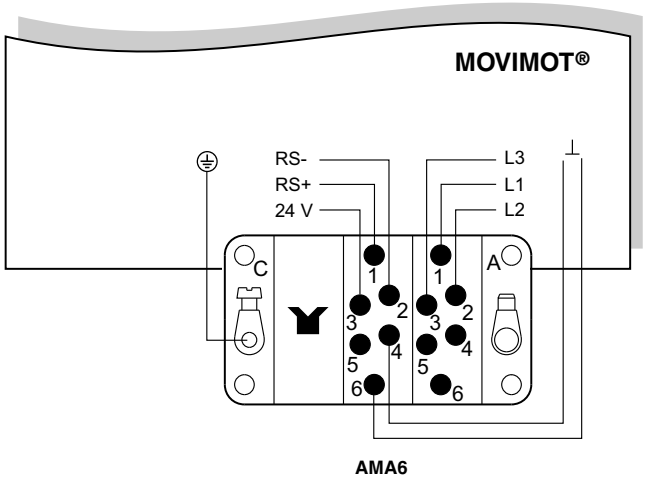
5.3.2 AMA6 plug connectors

The following illustration shows the assignment of the optional AMA6 plug connector.

Possible design:

- MM../AMA6



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INFORMATION

For designs with plug connectors, both directions of rotation are enabled as standard. If only one direction of rotation is required, please observe chapter "Connection of the MOVIMOT® drive, functions of the terminals CW/stop, CCW/stop for connection via RS-485 interface".

5.4 Connection between MOVIMOT® and motor when mounted close to the motor

If the MOVIMOT® inverter is mounted close to the motor, the connection to the motor is realized with a pre-fabricated hybrid cable.

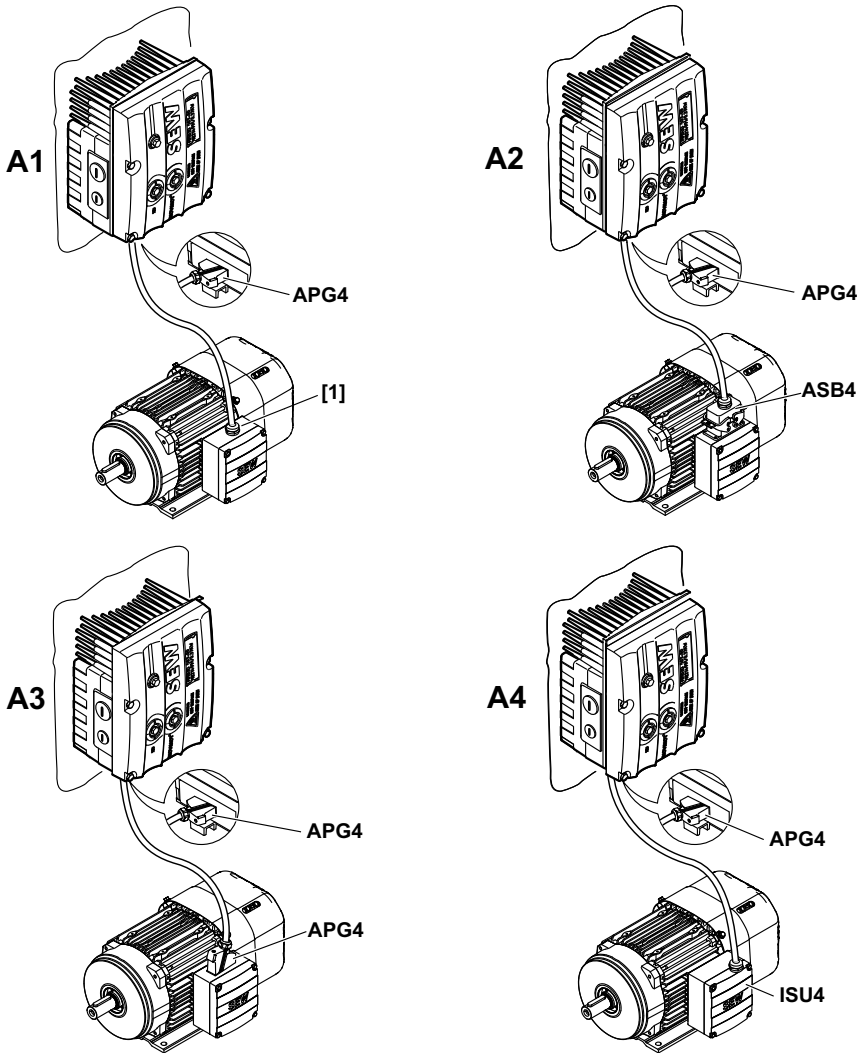
Use only hybrid cables from SEW-EURODRIVE to connect the MOVIMOT® inverter with the motor.

The following designs are possible on the MOVIMOT® side:

- A: MM../P2.A/RO.A/**APG4**
- B: MM../P2.A/RE.A/**ALA4**

The APG4 type results in the following connection options to the motor, depending on the hybrid cable used:

Design	A1	A2	A3	A4
MOVIMOT®	APG4	APG4	APG4	APG4
Motor	Cable gland/ terminals	ASB4	APG4	ISU4
Hybrid cable	0 186 742 3	0 593 076 6	0 186 741 5	0 816 325 1 △ for DR.63 0 816 326 X △ for DR.71–DR.132 0 593 278 5 人 for DR.63 0 593 755 8 人 for DR.71–DR.132

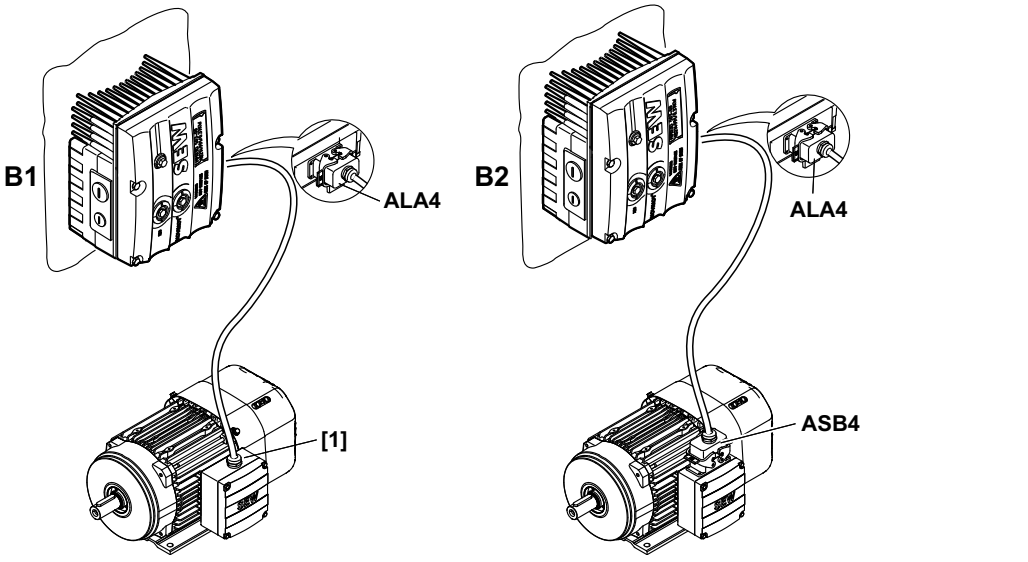


[1] Connection via terminals

458666635

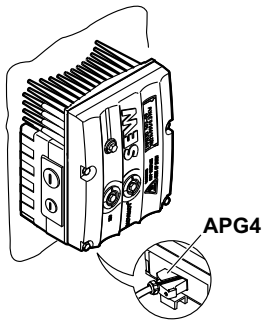
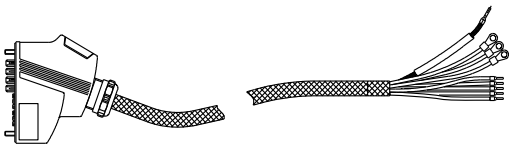
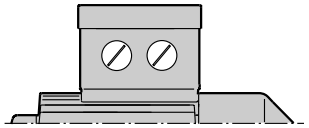
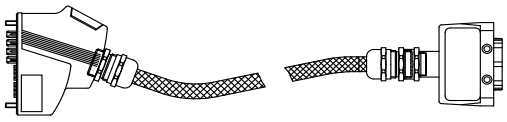
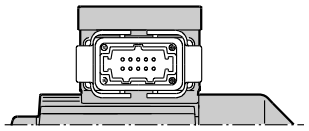
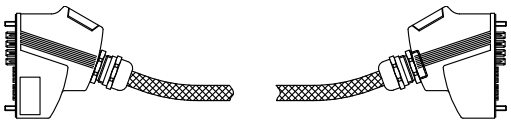
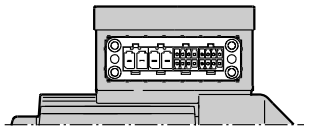
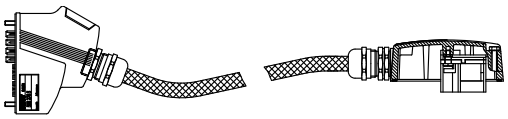
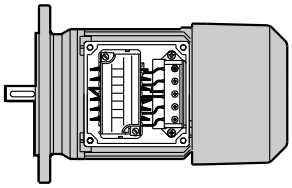
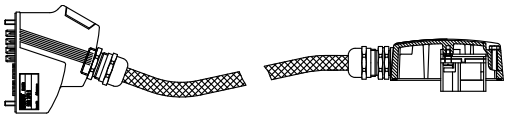
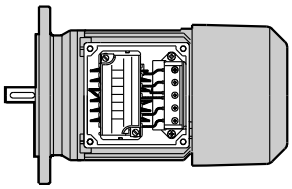
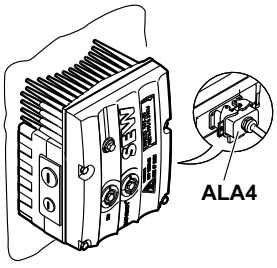
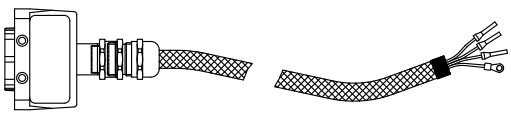
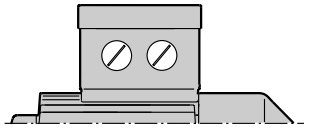
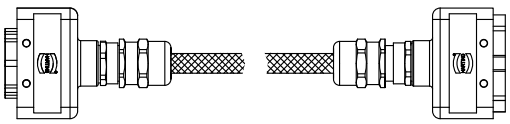
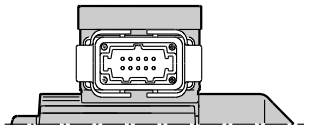
The APG4 design results in the following connection options to the motor, dependent upon the hybrid cable used:

Design	B1	B2
MOVIMOT®	ALA4	ALA4
Motor	Cable gland/terminals	ASB4
Hybrid cable	0 817 948 4	0 816 208 5



[1] Connection via terminals

5.4.1 Overview of connections between MOVIMOT® and motor when mounted close to the motor

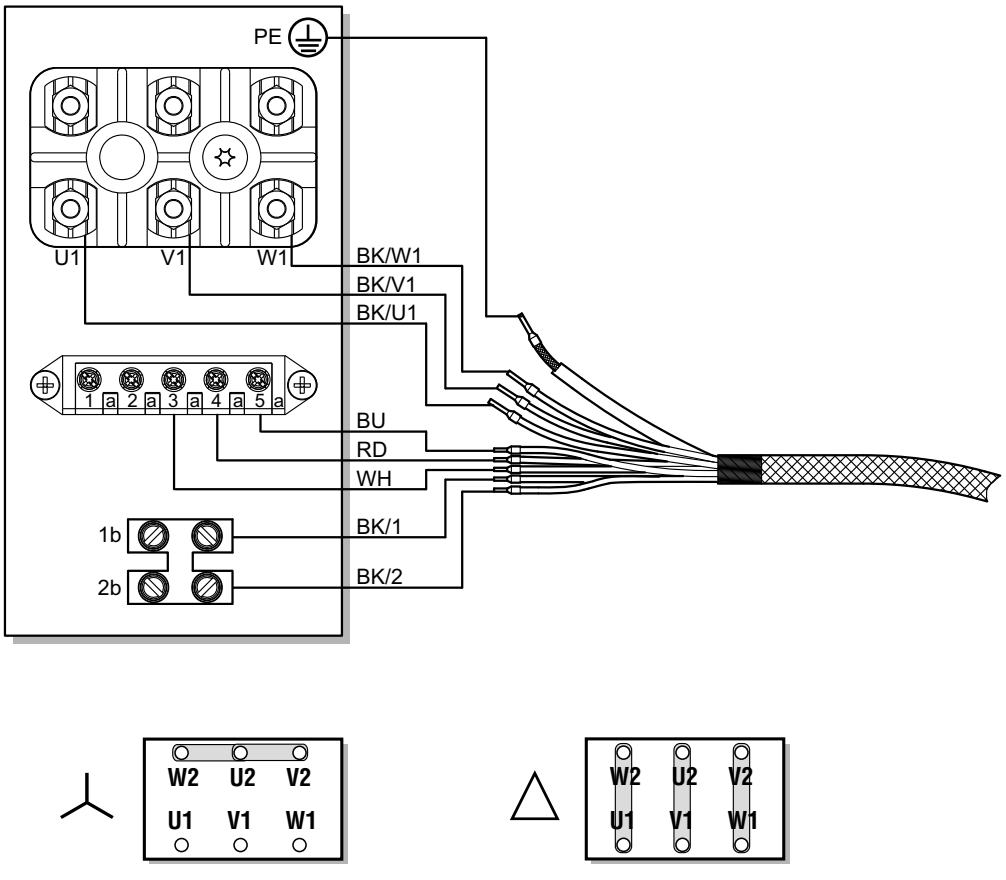
MOVIMOT® inverter	Design	Hybrid cable	Drive
MM../P2.A/RO.A/APG4 	A1	Part number DR71 – DR100: 0 186 742 3 Part number DR112 – DR132: 1 811 662 0 	AC motors with cable gland 
	A2	Part number: 0 593 076 6 	AC motors with ASB4 plug connector 
	A3	Part number: 0 186 741 5 	AC motors with APG4 plug connector 
	A4	Part number: 0 593 278 5 (⅄) Part number: 0 816 325 1 (△) 	AC motors with plug connector ISU4 Size DR.63 
	A4	Part number: 0 593 755 8 (⅄) Part number: 0 816 326 X (△) 	AC motors with plug connector ISU4 Size DR.71-DR.132 
MM../P2.A/RE.A/ALA4 	B1	Part number: 0 817 948 4 	AC motors with cable gland 
	B2	Part number: 0 816 208 5 	AC motors with ASB4 plug connector 

5.4.2 Hybrid cable connection

The following tables shows the conductor assignment in hybrid cables with part no. 0 186 742 3 and 0 817 948 4 and the corresponding motor terminals of the DR motor:

DR motor terminal	Wire color/hybrid cable designation
U1	Black/U1
V1	Black/V1
W1	Black/W1
4a	Red/13
3a	White/14
5a	Blue/15
1b	Black/1
2b	Black/2
PE connection	Green/yellow + shield end (internal shield)

The following figure shows the connection of the hybrid cable to the terminal box of the DR motor.



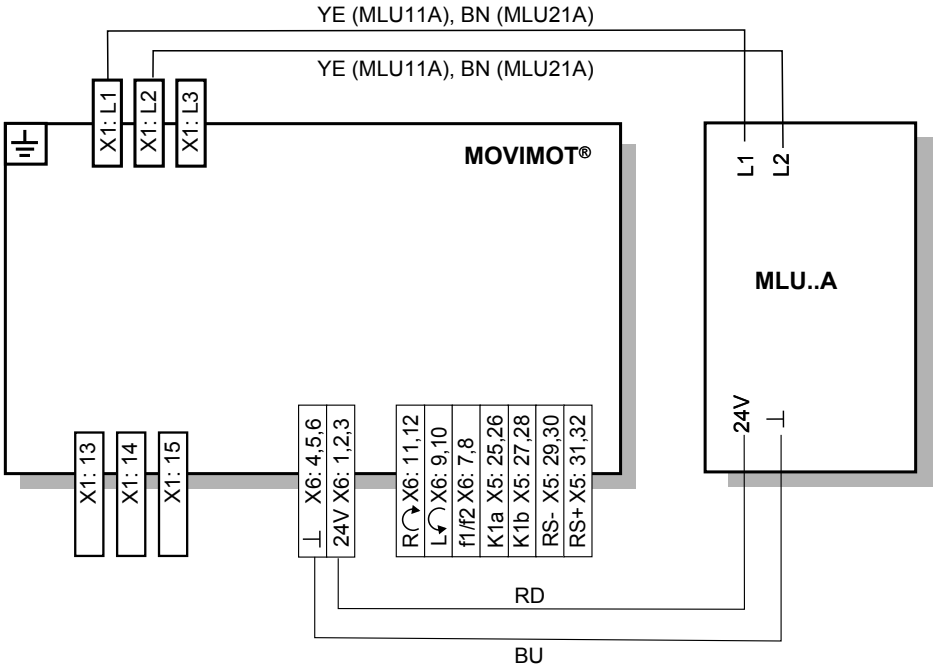
9007200445548683

5.5 Connection of the MOVIMOT® options

5.5.1 Connecting the MLU11A/MLU21A option

For more information about connecting the MLU11A and MLU21A options, refer to sec. "Connection of option MLU11A/MLU21A/MLG..A" (page 20).

The following figure shows how to connect the MLU11A and MLU21A options:

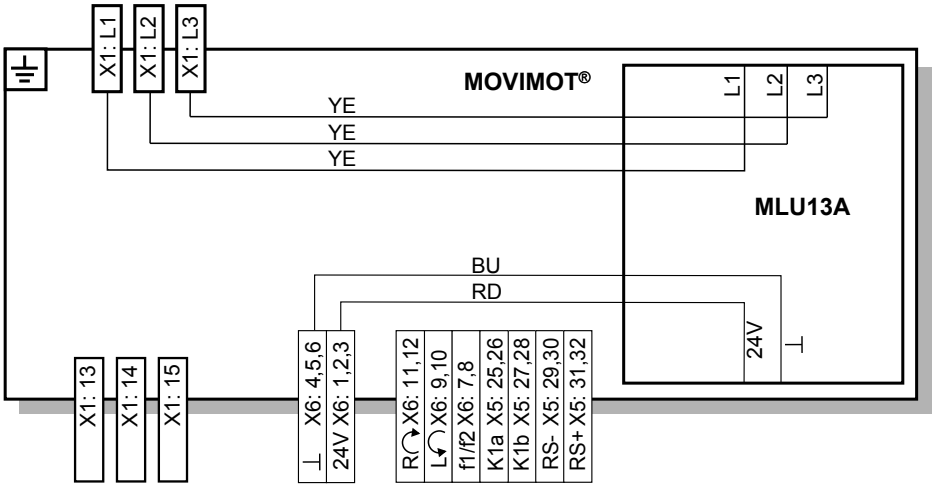


640436235

5.5.2 Connection of MLU13A option

For more information about mounting the MLU13A option, refer to chapter "MLU13A option" (page 20).

The following figure shows how to connect the MLU13A option:

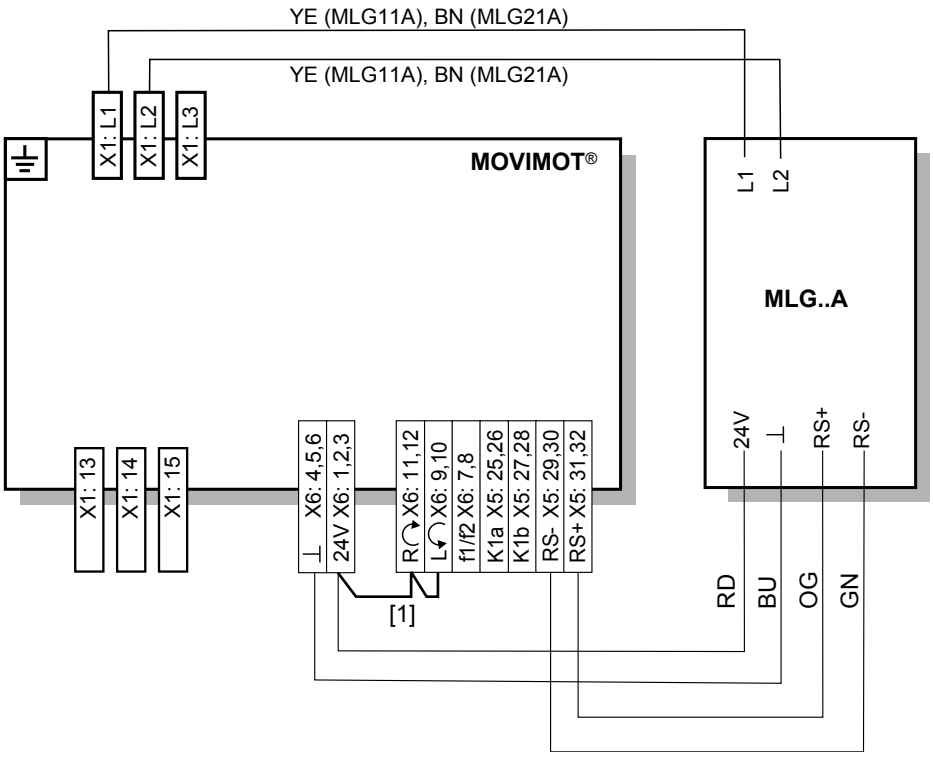


323967371

5.5.3 Connection of option MLG..A

For more information about mounting the MLG..A option, refer to sec. "MLU11A/ MLU21A/MLG..A option" (page 20).

The following figure shows how to connect the MLG..A option:



641925899

[1] Note the enabled direction of rotation.
See chapter "Connection of the MOVIMOT® drive" (page 36),
Functions of the CW/Stop and CCW/Stop terminals using control via RS-485 interface

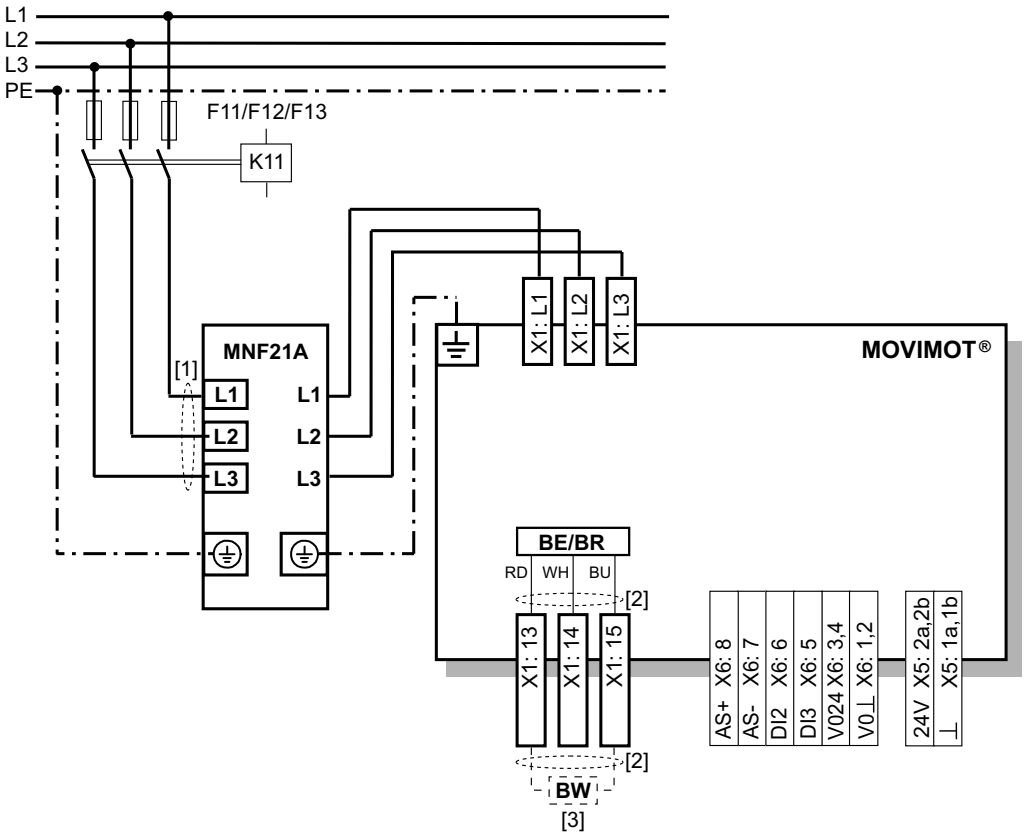
5.5.4 Connection of MNF21A option

INFORMATION

Only install this option in combination with the modular connection box of MOVIMOT® MM03D-503-00 – MM15D-503-00.

For more information about mounting the MNF21A option, refer to chapter "MNF21A option" (page 22).

The following figure shows how to connect the MNF21A option:



1754451723

[1] Keep the cable length for the power supply as short as possible!

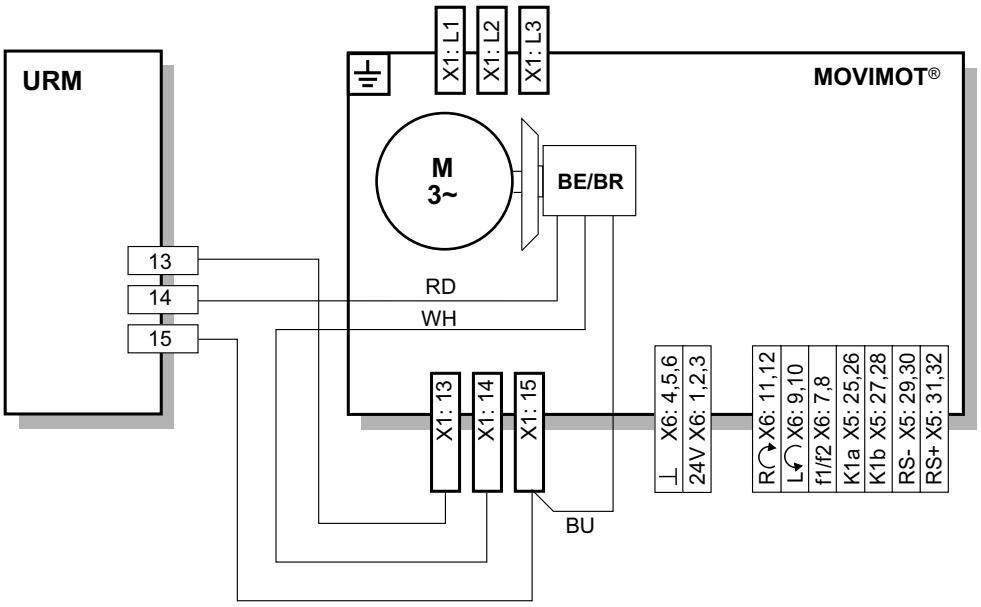
[2] Keep the length of the brake cables as short as possible!
Do not route the brake cables in parallel, but as far away from the power supply cables as possible!

[3] BW braking resistor (only in MOVIMOT® without mechanical brake)

5.5.5 Connection of URM option

For more information about mounting the URM option, refer to chapter "URM/BEM option" (page 23).

The following figure shows how to connect the URM option:

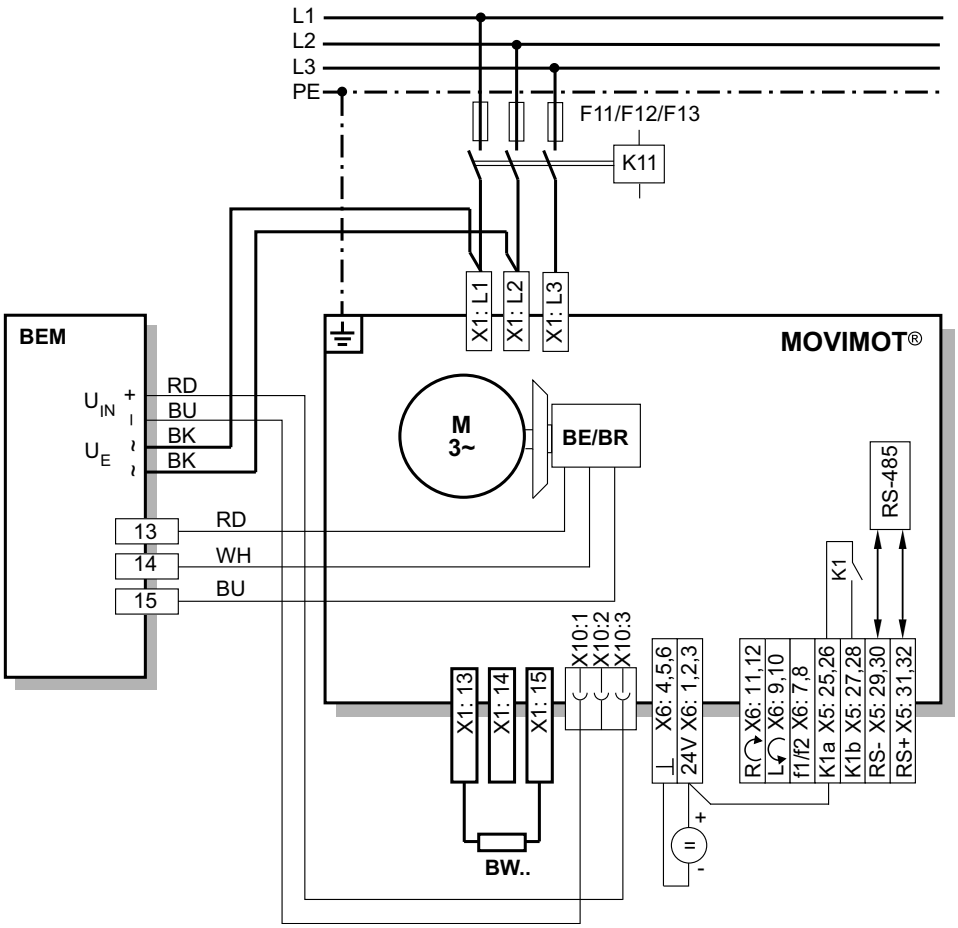


324118411

5.5.6 Connection of BEM option

For more information about mounting the BEM option, refer to chapter "URM/BEM/BES option" (page 23).

The following figure shows how to connect the BEM option:



324134539

5.5.7 Connection of BES option

NOTICE

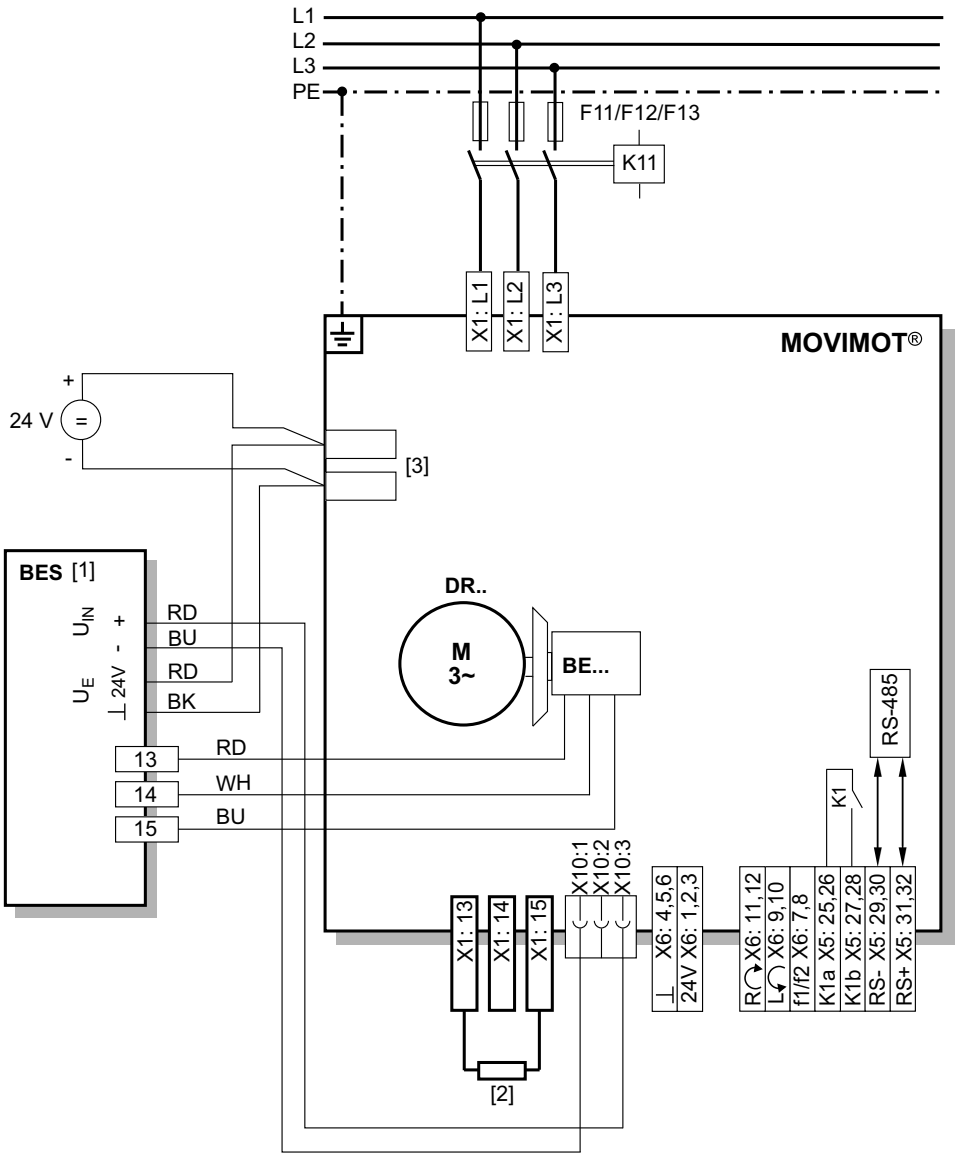
If the connection voltage is too high, the BES option or the brake coil connected to it can be damaged.

Damage to the BES option or the brake coil.

- Select a brake with a DC 24 V brake coil.

For more information about mounting the BES option, refer to chapter "URM/BEM/BES option" (page 23).

The following figure shows how to connect the BES option:



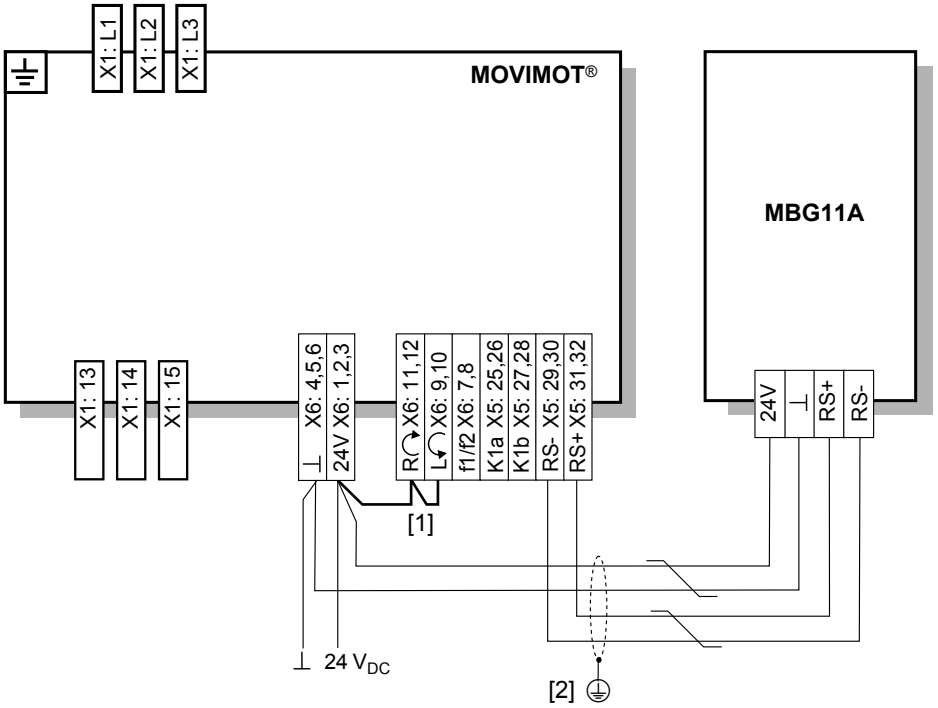
1711602315

[1] BES brake control mounted in the connection box
[2] External BW braking resistor
[3] Additional terminals for DC 24 V brake supply

5.5.8 Connection of MBG11A option

For more information about mounting the MBG11A option, refer to sec. "MBG11A option" (page 24).

The following figure shows how to connect the MBG11A option:



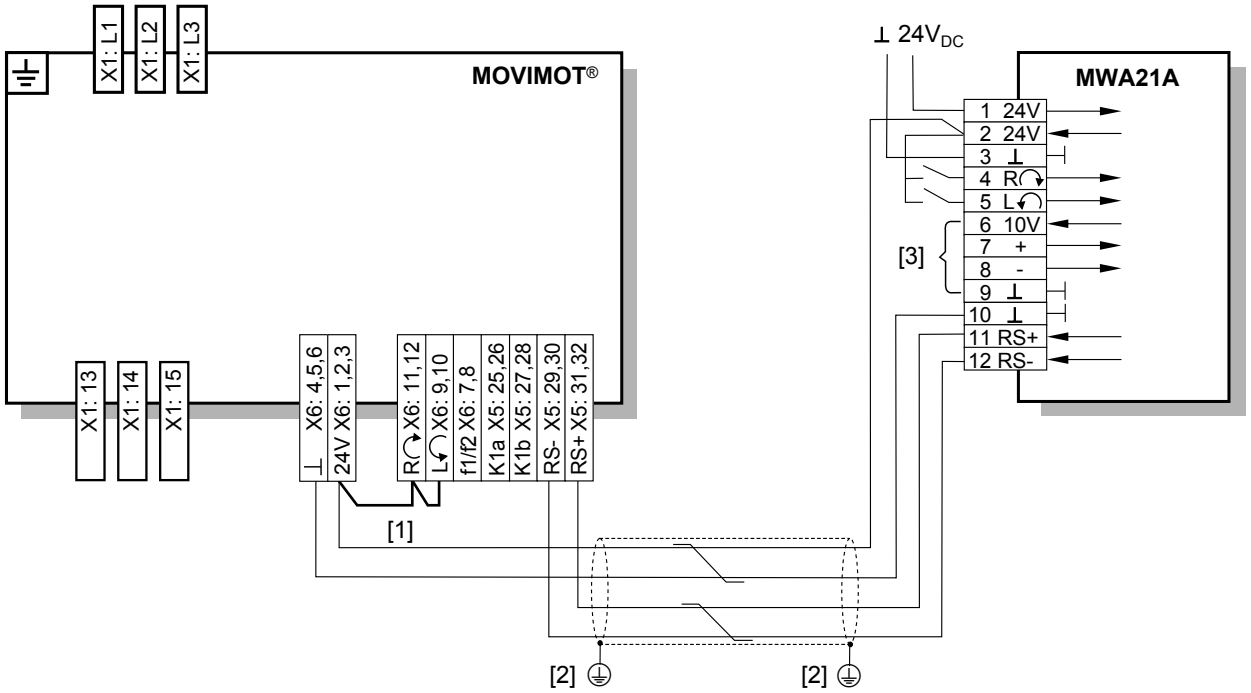
324046731

[1] Note the enabled direction of rotation.
See chapter "Connection of the MOVIMOT® drive" (page 36),
Functions of the CW/Stop and CCW/Stop terminals using control via RS-485 interface
[2] EMC metal cable gland

5.5.9 Connection of MWA21A option

For more information about mounting the MWA21A option, refer to sec. "MWA21A option" (page 25).

The following figure shows how to connect the MWA21A option:

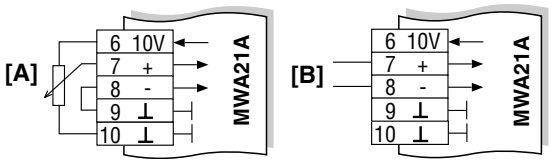


324061323

[1] Note the enabled direction of rotation.
See chapter "Connection of the MOVIMOT® drive" (page 36),
Functions of the CW/Stop and CCW/Stop terminals using control via RS-485 interface

[2] EMC metal cable gland

[3] Potentiometer using the 10 V reference voltage **[A]**
or potential-free analog signal **[B]**

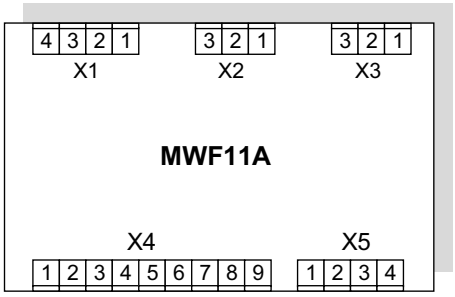


324089483

5.5.10 Connection of MWF11A option

For more information about mounting the MWF11A option, refer to chapter "MWF11A option" (page 26).

The following figure shows how to connect the MWF11A option:



3184574347

RS-485 interface		
X1	1	RS-485 + connection to MOVIMOT®
	2	RS-485- connection to MOVIMOT®
	3	RS-485 GND connection to MOVIMOT®
	4	Shielding

Frequency input		
X2	1	A
	2	No function
	3	GND

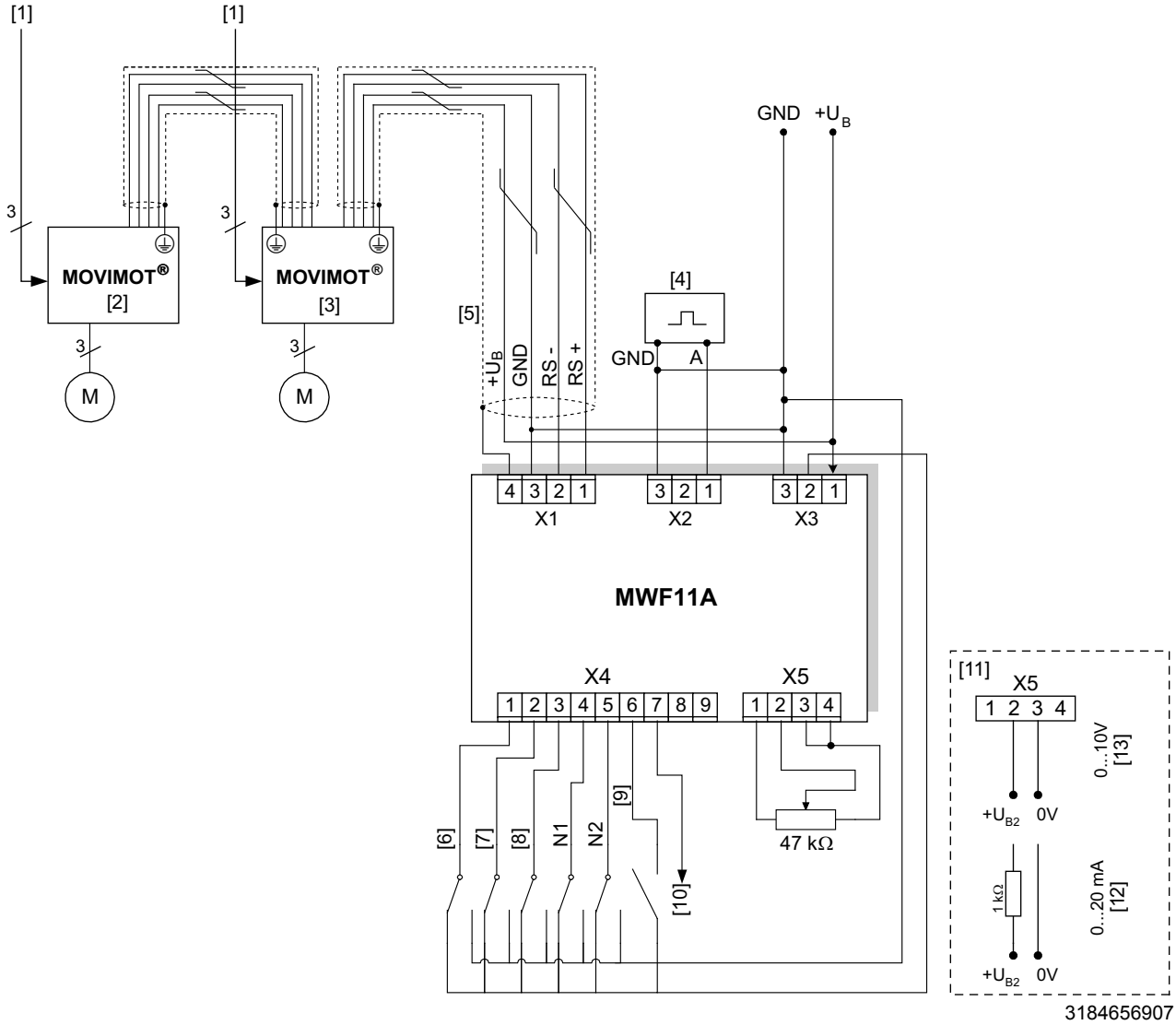
Voltage supply		
X3	1	+24 V (IN)
	2	+24 V (OUT)
	3	GND

Control terminals		
X4	1	Enable CW
	2	Enable CCW
	3	Enable/rapid stop
	4	n11
	5	n12
	6	Error reset
	7	/output fault
	8	/output (short-circuit proof) fault
	9	GND

Analog input (differential)		
X5	1	10 V off (for 47 kΩ potentiometer)
	2	AI11
	3	AI12 (reference)
	4	GND

Connection of MWF11A option in broadcast mode

The following figure shows an example of how to install the MWF11A option in broadcast mode:



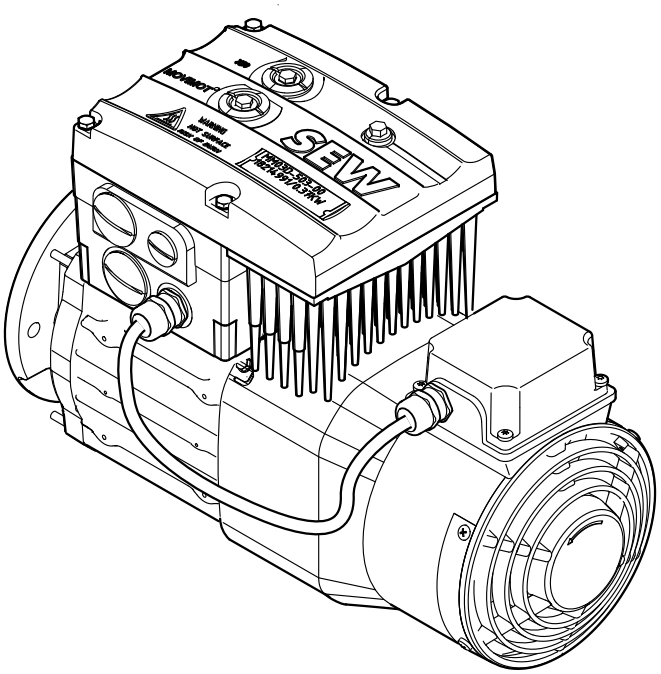
[1] Supply system
[2] MOVIMOT® with address 1
[3] MOVIMOT® with address 2
[4] Function generator
[5] In environments with increased interference level, you must ground the RS-485 cable shield at the mounting panel of the control cabinet
[6] Enable CW / stop
[7] Enable CCW / stop
[8] Enable/rapid stop
[9] Error reset
[10] /Fault
[11] Alternative setpoint specification
[12] I input
[13] U input

5.5.11 Connection of forced cooling fan V

The AC motors of the DR.. series are available with optional forced cooling fan V.

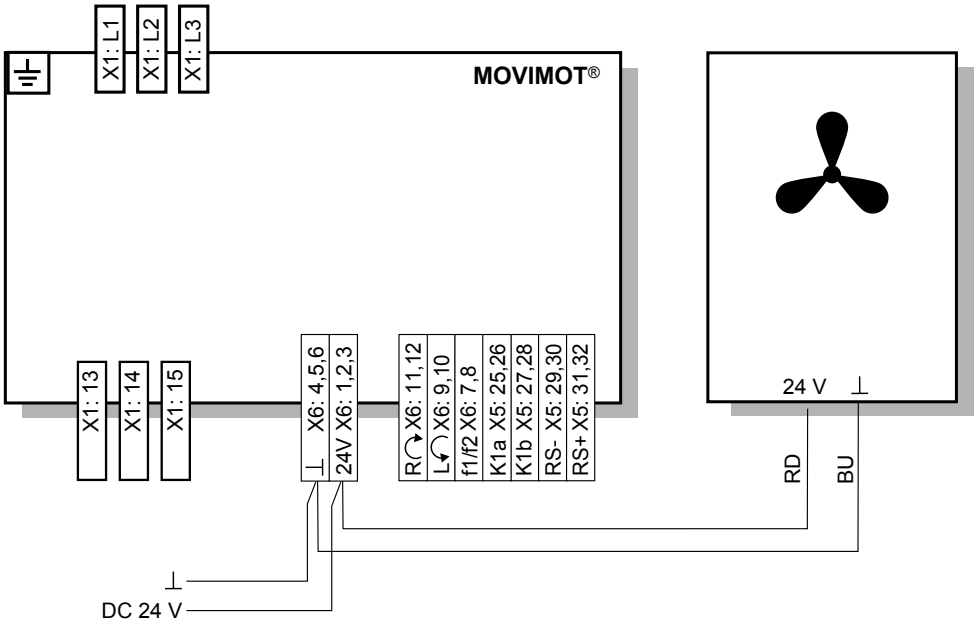
The use of the V forced cooling fan expands the setting range of the setpoint speed. This means that speeds from 150 rpm (5 Hz) can be realized continuously.

The following figure shows the routing of the forced cooling fan cable:



3169663499

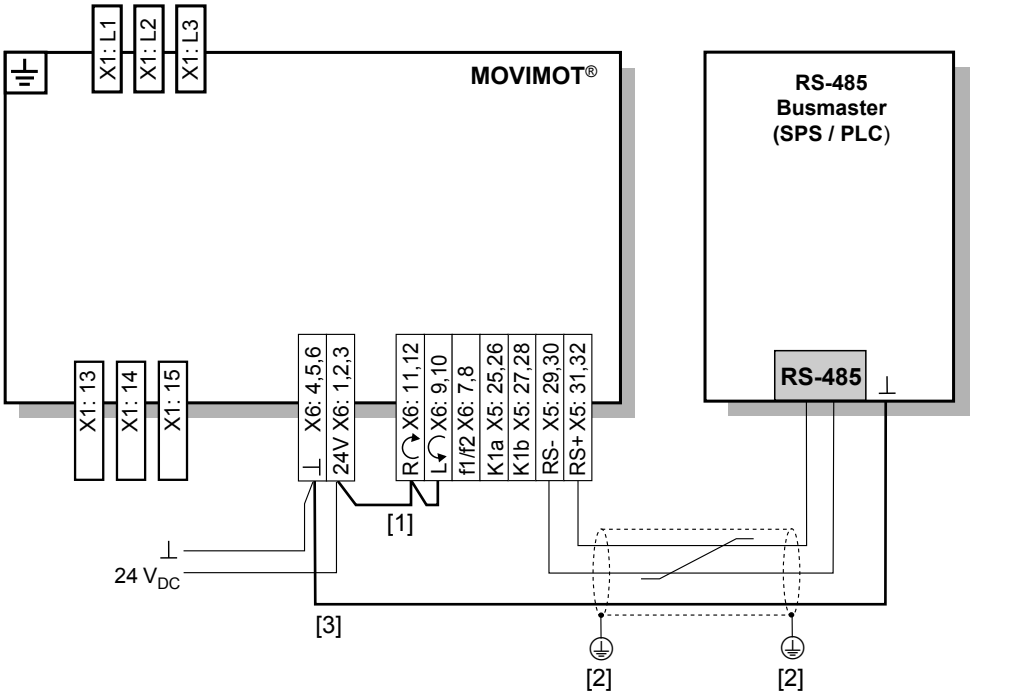
The following figure shows an example for the connection of the V forced cooling fan:



3182111115

5.6 Connection of RS-485 bus master

The following illustration shows how to connect an RS-485 bus master:



324289547

[1] Note the enabled direction of rotation.
See chapter "Connection of the MOVIMOT® drive" (page 36),
Functions of the CW/Stop and CCW/Stop terminals using control via RS-485 interface
[2] EMC metal cable gland
[3] Equipotential bonding MOVIMOT® / RS-485 master

5.7 Connecting the DBG keypad

MOVIMOT® drives are equipped with an X50 diagnostics interface (RJ10 plug connector) for startup, configuration and service.

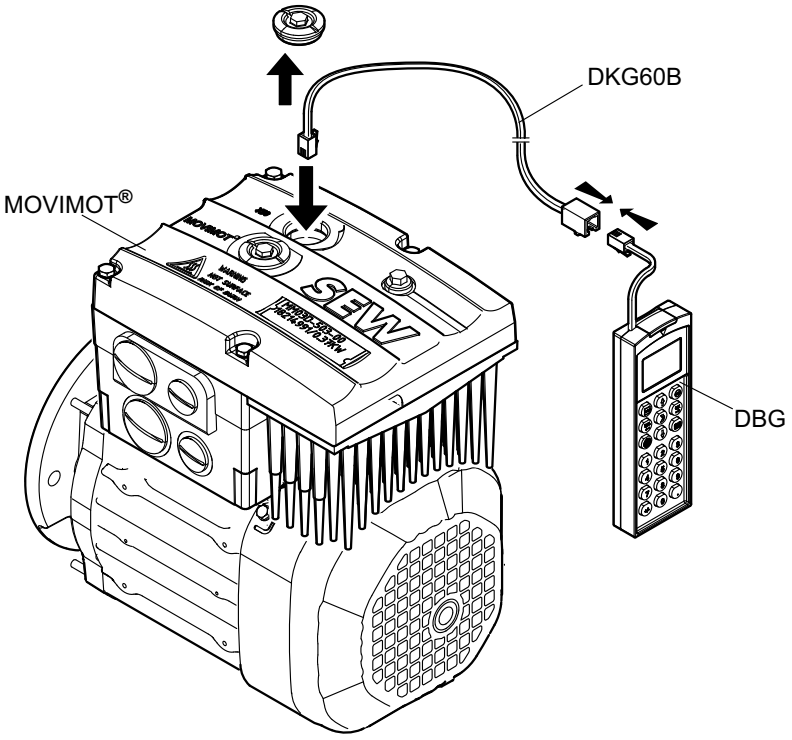
The X50 diagnostics interface is located under the screw plug on top of the MOVIMOT® inverter.

You must remove the screw plug before plugging in the connector into the diagnostic interface.

⚠ **DANGER** Danger of burns due to hot surfaces of the MOVIMOT® unit.

Severe injuries.

- Wait for the MOVIMOT® drive to cool down sufficiently before touching it.



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You can also connect the DBG keypad to the MOVIMOT® drive using option DKG60B (5 m extension cable).

Extension cable	Description (= scope of delivery)	Part number
DKG60B	• Length 5 m • 4-core, shielded cable (AWG26)	0 817 583 7

5.8 PC connection

MOVIMOT® drives are equipped with an X50 diagnostics interface (RJ10 plug connector) for startup, configuration and service.

The diagnostics interface [1] is located under the screw plug on top of the MOVIMOT® inverter.

You must remove the screw plug before plugging in the connector into the diagnostic interface.

⚠ **DANGER** Danger of burns due to hot surfaces of the MOVIMOT® drive (especially the heat sink).

Severe injuries.

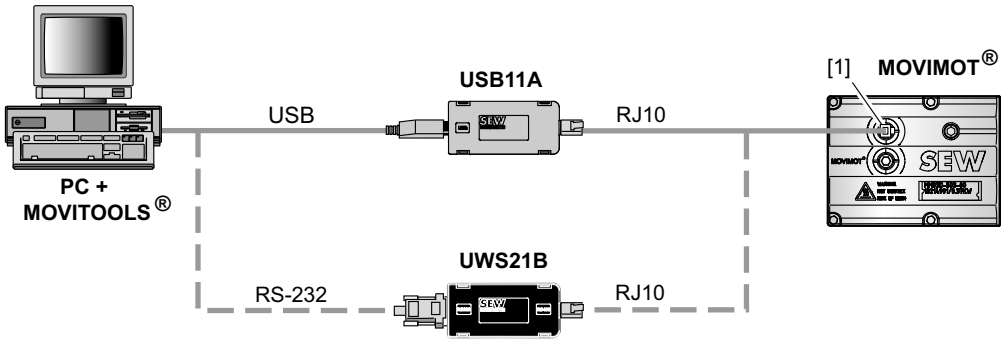
- Wait for the MOVIMOT® drive to cool down sufficiently before touching it.

The diagnostic interface can be connected to a PC using one of the following options:

- USB11A with USB interface, part number 0 824 831 1
- UWS21B with serial interface RS-232, part number 1 820 456 2

Scope of delivery:

- Interface adapter
- Cable with RJ10 plug connector
- Interface cable USB (USB11A) or RS-232 (UWS21B)



458786059

6 "Easy" Startup

6.1 Overview

You can select one of the following modes for starting up MOVIMOT® drives:

- When selecting **"Easy"**, you start up the MOVIMOT® drive using DIP switches S1, S2 and switches f2, t1, quick and easy.
- In **"Expert"** mode, an extended scope of parameters is available. You can use the MOVITOOLS® MotionStudio software or the DGB keypad to adjust the parameters to the application.

  For more information on "Expert" startup, refer to sec. " 'Expert' Startup with Parameter Function " (page 116).

6.2 Important notes on startup

INFORMATION

You must comply with the general safety notes in chapter "Safety Notes" during startup.

⚠ WARNING

Risk of crushing due to missing or defective protective covers.

Severe or fatal injuries.

- Install the protective covers of the plant according to the instructions, also see the operating instructions of the gear unit.
- Never start up the MOVIMOT® drive if the protective covers are not installed.

⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.

Severe or fatal injuries.

- De-energize the MOVIMOT® drive using a suitable cut-off device before removing the MOVIMOT® inverter.
- Secure the drive against unintended re-connection to the voltage supply.
- Wait for at least 1 minute before removing the MOVIMOT® inverter.

⚠ WARNING

Danger of burns due to hot surfaces of the MOVIMOT® drive (especially the heat sink) or external options.

Severe injuries.

- Do not touch the MOVIMOT® drive and external options until they have cooled down sufficiently.

⚠ WARNING

Unit malfunction due to incorrect unit setting.

Severe or fatal injuries.

- Observe the startup instructions.
- The installation must only be carried out by qualified personnel.
- Only use settings that are consistent with the function.

INFORMATION

To ensure fault-free operation, do not disconnect or connect power or signal cables during operation.

INFORMATION

- Remove paint protection cap from the status LED before startup.
- Remove paint protection film from the nameplates before startup.
- Observe a minimum switch-off time of 2 seconds for the line contactor K11.

6.3 Requirements

The following conditions apply to startup:

- The MOVIMOT® drive must be installed correctly both mechanically and electrically.
- Appropriate safety measures prevent the drives from starting up unintentionally.
- Appropriate safety measures must be taken to prevent risk of injury or damage to machine.

6.4 Description of control elements

6.4.1 Setpoint potentiometer f1

NOTICE

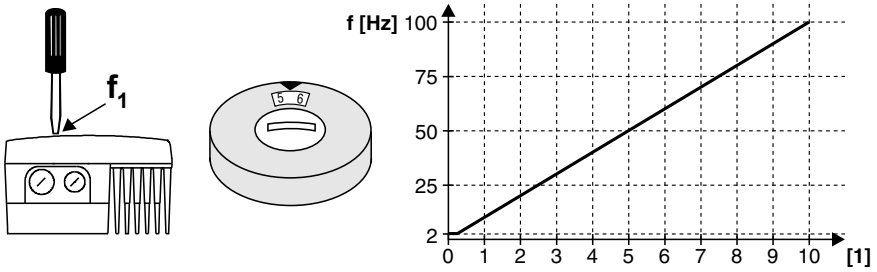
Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

Damage to the MOVIMOT® inverter.

- After setting the setpoint, make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

Depending on the operating mode of the MOVIMOT® inverter, the potentiometer f1 has different functions:

- Binary control: Setting setpoint f1
  (f1 is selected via terminal f1/f2 X6:7,8 = "0")
- Control via RS-485: Setting maximum frequency f_{max}



[1] Potentiometer setting 329413003

6.4.2 Switch f2

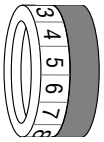
Depending on the operating mode of the MOVIMOT® inverter, switch f2 has different functions:

- Binary control: Setting setpoint f2
  (f2 is selected via terminal f1/f2 X6:7,8 = "1")
- Control via RS-485: Setting minimum frequency f_{min}

Switch f2											
Detent setting	**0**	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz]	**5**	7	10	15	20	25	35	50	60	70	100
Minimum frequency [Hz]	**2**	5	7	10	12	15	20	25	30	35	40

6.4.3 Switch t1

Use switch t1 to set the acceleration of the MOVIMOT® drive. The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).



Switch t1											
Detent setting	0	1	2	3	4	**5**	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	**1**	2	3	5	7	10

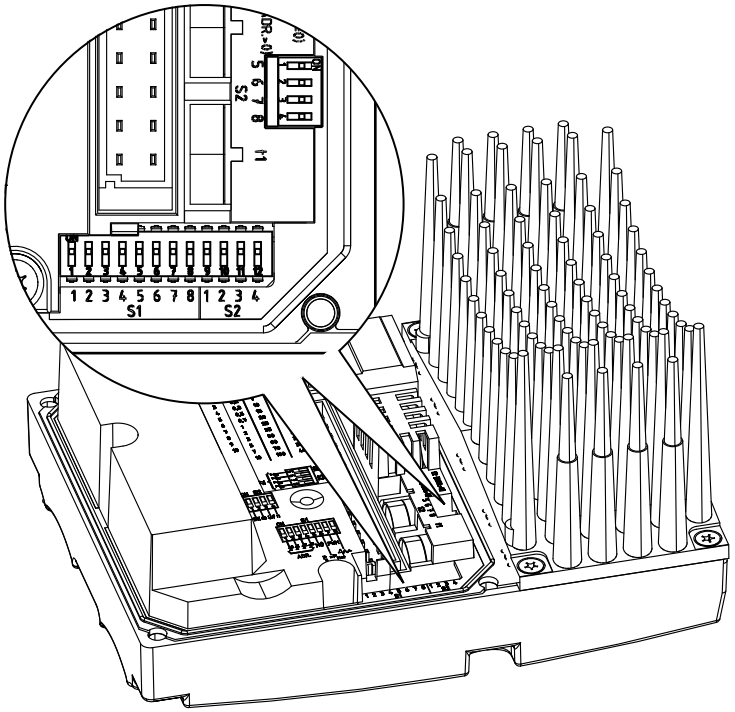
6.4.4 DIP switches S1 and S2

NOTICE

Damage to the DIP switches caused by unsuitable tools.

Damage to the DIP switches.

- To set the DIP switches, use only suitable tools, such as a slotted screwdriver with a blade width of no more than 3 mm.
- The force used for setting the DIP switches must not exceed 5 N.



626648587

DIP switch S1:

S1	1	2	3	4	5	6	7	8
Meaning	**Binary coding RS-485 unit address**				**Motor protection**	**Motor power rating**	**PWM frequency**	**No-load damping**
	2^0	2^1	2^2	2^3				
ON	1	1	1	1	Off	Motor one stage smaller	Variable (16, 8, 4 kHz)	On
OFF	**0**	**0**	**0**	**0**	**On**	**Motor adjusted**	**4 kHz**	**Off**

DIP switch S2:

S2	1	2	3	4
Meaning	**Brake type**	**Brake released without enable**	**Operating mode**	**Speed monitoring**
ON	Optional brake	On	V/f	On
OFF	**Standard brake**	**Off**	**VFC**	**Off**

5	6	7	8
Binary encoding addit. functions			
2^0	2^1	2^2	2^3
1	1	1	1
0	**0**	**0**	**0**

6.5 Description of the DIP switches S1

6.5.1 DIP switches S1/1 – S1/4

Selecting the RS-485 address of the MOVIMOT® drive via binary coding

Decimal address	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S1/1	–	X	–	X	–	X	–	X	–	X	–	X	–	X	–	X
S1/2	–	–	X	X	–	–	X	X	–	–	X	X	–	–	X	X
S1/3	–	–	–	–	X	X	X	X	–	–	–	–	X	X	X	X
S1/4	–	–	–	–	–	–	–	–	X	X	X	X	X	X	X	X

X = ON
– = OFF

Set the following addresses depending on how the MOVIMOT® inverter is controlled:

Control	RS-485 address
Binary control	0
Via keypad (MLG..A, MBG..A)	1
Via fieldbus interface (MF..)	1
Via MOVIFIT® MC (MTM..)	1
Via intelligent fieldbus interface (MQ..)	1 – 15
Via RS-485 master	1 – 15
Via MWF11A setpoint converter	1 – 15

6.5.2 DIP switch S1/5

Motor protection switched on / off

When MOVIMOT® is installed close to the motor, the motor protection function must be deactivated.

To ensure that the motor is protected all the same, a TH (bimetallic thermostat) must be installed. The TH opens the sensor circuit when the nominal response temperature is reached (see field distributor manual).

6.5.3 DIP switch S1/6

Lower motor power rating

- When activated, DIP switch S1/6 can be used to assign the MOVIMOT® inverter to a motor with a lower power rating. The nominal unit power is not affected.
- When using a motor with a lower power rating, the MOVIMOT® inverter is one power level above the motor. This is why you can increase the overload capacity of the drive. A higher current can be provided briefly, leading to higher torque ratings.
- The aim of this switch S1/6 is to achieve short-term utilization of the motor's peak torque. The unit's current limit remains the same regardless of the switch setting. The motor protection function is adjusted depending on the switch setting.
- Stall protection for the motor is not possible in this operating mode (S1/6 = "ON").

Power rating [kW]	Motor type 230/400 V 50 Hz[1)]	MOVIMOT® type (inverter)			
		Motor in ⅄ connection		Motor in △ connection	
		S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON
0.25	DFR63L4/..	-	MM**03**D-503-00..	MM**03**D-503-00..	MM**05**D-503-00..
0.37	DR**S**71S4/TH.	MM**03**D-503-00..	MM**05**D-503-00..	MM**05**D-503-00..	MM**07**D-503-00..
0.55	DR**S**71M4/..	MM**05**D-503-00..	MM**07**D-503-00..	MM**07**D-503-00..	MM**11**D-503-00..
0.75	DR**S**80S4/.. DR**E**80M4/.. DR**P**90M4/..	MM**07**D-503-00..	MM**11**D-503-00..	MM**11**D-503-00..	MM**15**D-503-00..
1.1	DR**S**80M4/.. DR**E**90M4/.. DR**P**90L4/..	MM**11**D-503-00..	MM**15**D-503-00..	MM**15**D-503-00..	MM**22**D-503-00..
1.5	DR**S**90M4/.. DR**E**90L4/.. DR**P**100M4/..	MM**15**D-503-00..	MM**22**D-503-00..	MM**22**D-503-00..	MM**30**D-503-00..
2.2	DR**S**90L4/.. DR**E**100M4/.. DR**P**100L4/..	MM**22**D-503-00..	MM**30**D-503-00..	MM**30**D-503-00..	MM**40**D-503-00..
3	DR**S**100M4/.. DR**E**100LC4/.. DR**P**112M4/..	MM**30**D-503-00..	MM**40**D-503-00..	MM**40**D-503-00..	–
4	DR**S**100LC4/.. DR**E**132S4/.. DR**P**132M4/..	MM**40**D-503-00..	–	–	–

1) On request, SEW-EURODRIVE provides the motor assignment of motors with 230/400 V, 60 Hz or 266/460 V, 60 Hz.

6.5.4 DIP switch S1/7

Setting the maximum PWM frequency

- When DIP switch S1/7 is set to "OFF", MOVIMOT® operates with PWM frequency of 4 kHz.
- When DIP switch S1/7 is set to "ON", MOVIMOT® operates with PWM frequency of 16 kHz (low noise). The unit switches to lower cycle frequencies depending on the heat sink temperature and inverter load.

6.5.5 DIP switch S1/8

No-load vibration damping

When setting DIP switch S1/8 = "ON", this function reduces resonance during no-load operation.

6.6 Description of DIP switches S2

6.6.1 DIP switch S2/1

Brake type

- When using the standard brake, the DIP switch 2/1 must be set to "OFF".
- When using the optional brake, the DIP switch 2/1 must be set to "ON".

Motor	Standard brake [type] S2/1 = "OFF"	Optional brake [type] S2/1 = "ON"
DR.63L4	BR03	–
DR.71S4	BE05	BE1
DR.71M4	BE1	BE05
DR.80S4	BE1	BE05
DRS80M4	BE2	BE1
DRE80M4	BE1	BE05
DRS90M4	BE2	BE1
DRE90M4	BE2	BE1
DRP90M4	BE1	BE2
DRS90L4	BE5	BE2
DRE90L4	BE2	BE1
DRP90L4	BE2	BE1
DRS100M4	BE5	BE2
DRE100M4	BE5	BE2
DRP100M4	BE2	BE5
DR.100L4	BE5	BE2
DR.100LC4	BE5	BE2
DRP112M4	BE5	BE11
DR.132S4	BE5	BE11
DRP132M4	BE5	BE11

Preferred brake voltage

MOVIMOT® type (inverter)		Preferred brake voltage
MOVIMOT® MM..D-503, size 1	(MM03.. – MM15..)	230 V
MOVIMOT® MM..D-503, size 2	(MM22.. – MM40..)	120 V
MOVIMOT® MM..D-233, size 1 and 2	(MM03.. – MM40..)	

6.6.2 DIP switch S2/2

Brake release without enable

When DIP switch S2/2 is set to "ON", it is possible to release the brake even if there is no drive enable.

Binary control functions

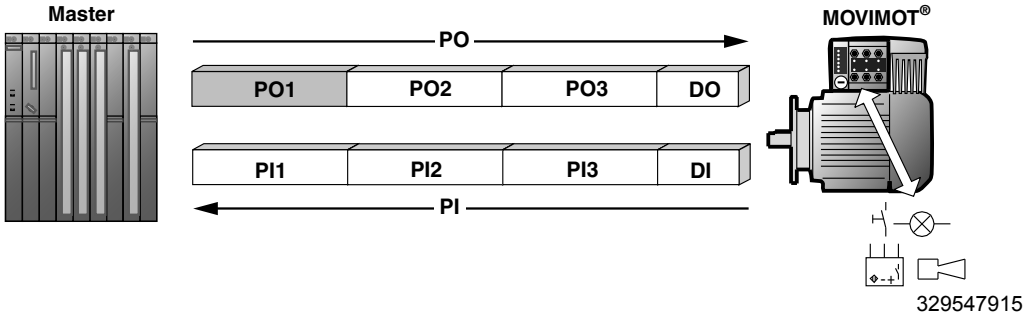
In binary control, the brake can be released by setting the signal at terminal f1/f2 X6:7,8 subject to the following preconditions:

Terminal status			Enable status	Error status	Brake function
R ↻ X6:11,12	L ↺ X6:9,10	f1/f2 X6:7,8			
"1" "0"	"0" "1"	"0"	Unit enabled	No unit error	The MOVIMOT® inverter controls the brake. setpoint f1
"1" "0"	"0" "1"	"1"	Unit enabled	No unit error	The MOVIMOT® inverter controls the brake. setpoint f2
"1" "0"	"1" "0"	"0"	Unit not enabled	No unit error	Brake applied
"1"	"1"	"1"	Unit not enabled	No unit error	Brake applied
"0"	"0"	**"1"**	**Unit not enabled**	**No unit error**	**Brake is released for manual movement**[1)]
All states possible			Unit not enabled	Unit error	Brake applied

1) In "Expert" mode, parameter *P600* (terminal configuration) must be set to = "0" (default) for this purpose => "setpoint changeover CCW/stop - CW/stop".

RS-485 control functions

In RS-485 control, the brake is released via the control word:



PO = Process output data	PI = Process input data
PO1 = Control word	PI1 = Status word 1
PO2 = Speed [%]	PI2 = Output current
PO3 = Ramp	PI3 = Status word 2
DO = Digital outputs	DI = Digital inputs

By setting bit 8 in the control word, the brake can be released if the following conditions are met:

								Basic control block							
15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**

Control word

not assigned[1)]	**Bit "9"**	**Bit "8"**	Not assigned[1)]	"1" = Reset	Not assigned[1)]	"1 1 0" = enable, otherwise stop

Virtual terminals for releasing the brake without drive enable

Virtual terminal for applying brake and inhibiting output stage "Stop" control command

1) Recommendation for all bits that are not assigned = "0"

Enable status	Error status	Status of bit 8 in control word	Brake function
Unit enabled	No unit error / no communication timeout	"0"	The MOVIMOT® inverter controls the brake.
Unit enabled	No unit error / no communication timeout	"1"	The MOVIMOT® inverter controls the brake.
Unit not enabled	No unit error / no communication timeout	"0"	Brake applied
Unit not enabled	**No unit error/no communication timeout**	**"1"**	**Brake is released for manual movement**
Unit not enabled	Unit error/communication timeout	"1" or "0"	Brake applied

Setpoint selection for binary control

Setpoint selection in binary control depending on the state of terminal f1/f2 X6: 7,8:

Enable status	Terminal f1/f2 X6:7,8	Active setpoint
Unit enabled	Terminal f1/f2 X6:7,8 = "0"	Setpoint potentiometer f1 active
Unit enabled	Terminal f1/f2 X6:7,8 = "1"	Setpoint potentiometer f2 active

Behavior if unit not ready

If the unit is not ready, the brake is always applied irrespective of the status of terminal f1/f2 X6:7,8 or bit 8 in the control word.

LED display

The status LED flashes periodically at a fast rate (t_{on} : t_{off} = 100 ms : 300 ms) if the brake has been released for manual movement. This applies both for binary control and for control via RS-485.

6.6.3 DIP switch S2/3

Control mode

- DIP switch S2/3 = "OFF": VFC operation for 4-pole motors
- DIP switch S2/3 = "ON": V/f operation reserved for special cases

6.6.4 DIP switch S2/4

Speed monitoring

- Speed monitoring (S2/4 = "ON") protects the drive when it is blocked.
- If the drive is operated at the current limit for longer than 1 second when speed monitoring is active (S2/4 = "ON"), the MOVIMOT® inverter trips the speed monitoring. The status LED of the MOVIMOT® inverter signalizes the error by slowly flashing red (error code 08). This error only occurs when the current limit has been reached for the duration of the deceleration time.

6.6.5 DIP switches S2/5 – S2/8

Additional functions

- The binary coding of the DIP switches S2/5 - S2/8 allows for the activation of additional functions.
- Proceed as follows to activate possible additional functions:

Decimal value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S2/5	–	**X**	–	**X**	–	**X**	–	**X**	–	**X**	–	**X**	–	**X**	–	**X**
S2/6	–	–	**X**	**X**	–	–	**X**	**X**	–	–	**X**	**X**	–	–	**X**	**X**
S2/7	–	–	–	–	**X**	**X**	**X**	**X**	–	–	–	–	**X**	**X**	**X**	**X**
S2/8	–	–	–	–	–	–	–	–	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

X = ON
– = OFF

- For an overview of additional functions, refer to chapter "Selectable additional functions" (page 67).

6.7 Selectable additional functions MM..D-503-00

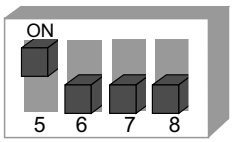
6.7.1 Overview of the available additional functions

You can activate the following additional functions at the DIP switches S2/5 – S2/8:

Decimal value	Brief description	Operating mode		Description
		Control via RS-485	Binary control	
0	Basic functionality, no additional function active	X	X	–
1	MOVIMOT® with increased ramp times	X	X	(page 68)
2	MOVIMOT® with adjustable current limitation (Fault if exceeded)	X	X	(page 68)
3	MOVIMOT® with adjustable current limitation (can be changed using terminal f1/f2 X6:7,8)	X	X	(page 69)
4	MOVIMOT® with bus parameterization	X	–	(page 71)
5	MOVIMOT® with motor protection via TH	X	–	(page 73)
6	MOVIMOT® with maximum PWM frequency of 8 kHz	X	X	(page 74)
7	MOVIMOT® with rapid start / stop	X	X	(page 75)
8	MOVIMOT® with minimum frequency 0 Hz	X	X	(page 77)
9	MOVIMOT® for hoist applications	X	X	(page 78)
10	MOVIMOT® with minimum frequency 0 Hz and reduced torque at low frequencies	X	X	(page 81)
11	Monitoring of supply-phase failure deactivated	X	X	(page 82)
12	MOVIMOT® with rapid start/stop and motor protection via TH	X	X	(page 82)
13	MOVIMOT® with extended speed monitoring function	X	X	(page 86)
14	MOVIMOT® with deactivated slip compensation	X	X	(page 89)
15	Not connected	–	–	–

6.7.2 Additional function 1

MOVIMOT® with increased ramp times



S2

329690891

Functional description

- It is possible to set ramp times of up to 40 s.
- In RS-485 control mode, a ramp time of max. 40 s can be transmitted when using 3 process data units.

Changed ramp times

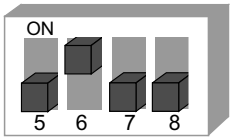
Switch t1											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	20	25	30	35	40

= corresponds to standard setting

= changed ramp times

6.7.3 Additional function 2

MOVIMOT® with adjustable current limitation (error if exceeded)



S2

329877131

Functional description

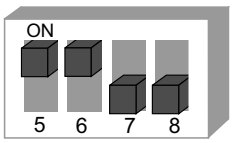
- The current limit can be set using switch f2.
- The setpoint f2 (for binary control) and the minimum frequency (for control via RS485) are permanently set to the following values:
  - Setpoint f2: 5 Hz
  - Minimum frequency: 2 Hz
- The monitoring function comes into effect above 15 Hz. If the drive operates at the current limit for longer than 500 ms, the unit generates an error (error 44). This is indicated by the status LED flashing red quickly.

Adjustable current limits

Switch f2											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
I_{max} [%] of I_N	90	95	100	105	110	115	120	130	140	150	160

6.7.4 Additional function 3

MOVIMOT® with adjustable current limitation (can be changed using using terminal f1/f2 X6:7,8), the frequency is reduced when exceeded



S2

329910539

Functional description

The current limitation can be set using switch f2. Binary input terminal f1/f2 can be used to switch between the maximum current limit and the set current limit.

Response upon reaching the current limit

- Upon reaching the current limit, the unit reduces the frequency and stops the ramp. This prevents the current from rising.
- If the unit is operating at the current limit, the status LED indicates this status by flashing green quickly.

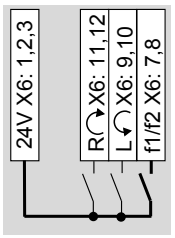
System internal values for setpoint f2 / minimum frequency

- The following functions are no longer possible:
  - In binary control mode: switching between setpoint f1 and setpoint f2 via terminal f1/f2.
  - In RS-485 control mode: setting the minimum frequency
- The minimum frequency in RS-485 control mode is set to 2 Hz.

Adjustable current limits

Switch f2											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
I_{max} [%] of I_N	60	70	80	90	100	110	120	130	140	150	160

Selecting the current limits via binary input terminal f1 / f2



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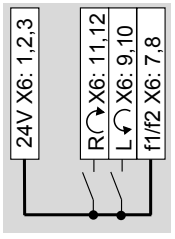
f1/f2 = "0" Default current limit is active



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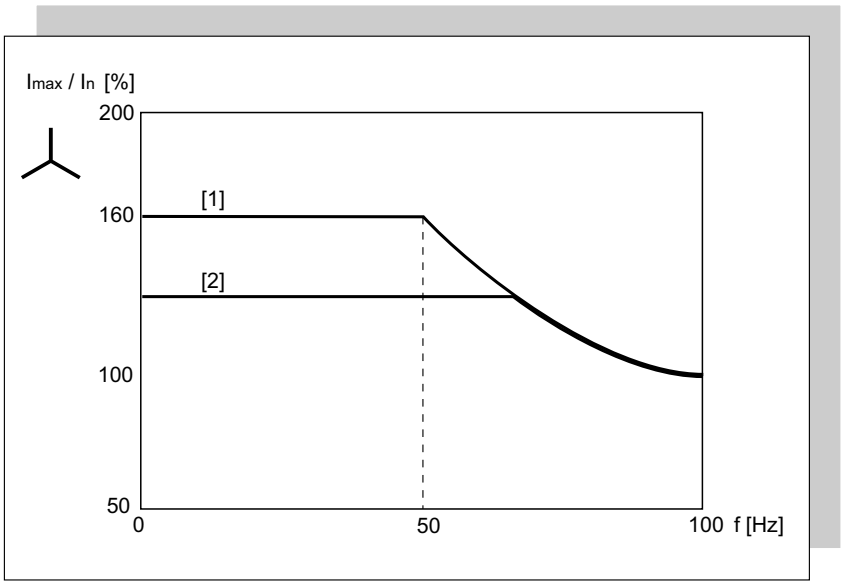
f1/f2 = "1" The current limitation set via switch f2 is active.
The selection can also be made when the unit is enabled.

Influencing the current characteristic curve

The current limit curve is calculated with a constant factor by selecting a lower current limit.

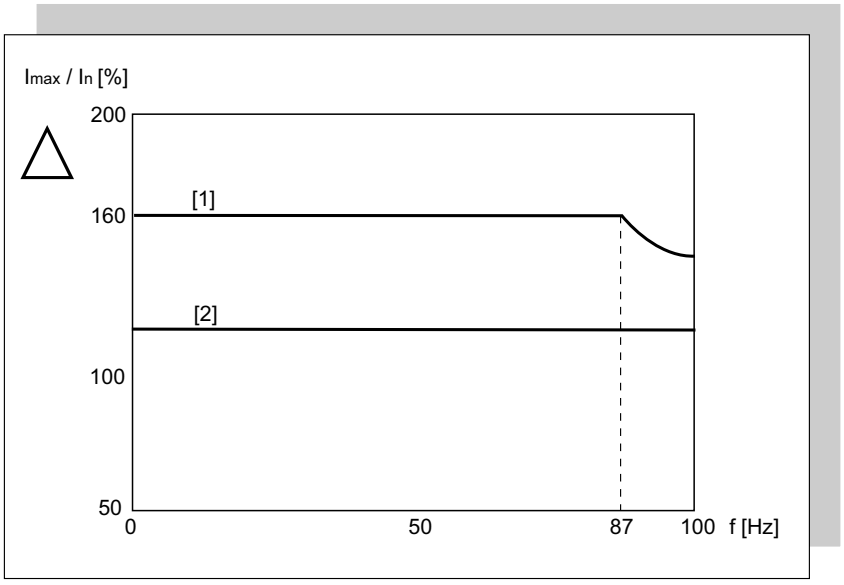
Motor with star connection



331979659

[1] Current limit characteristic curve of standard function
[2] Reduced current limit for additional function 3 and terminals f1/f2 X6:7,8 = "1"

Motor with delta connection

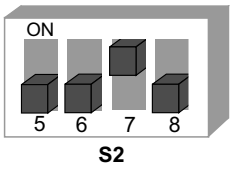


332087051

[1] Current limit characteristic curve of standard function
[2] Reduced current limit for additional function 3 and terminals f1/f2 X6:7,8 = "1"

6.7.5 Additional function 4

MOVIMOT® with bus configuration



329944715

INFORMATION

When activating additional function 4, only a limited number of parameters is available. If you want to adjust more parameters, SEW-EURODRIVE recommends using "Expert" startup with parameter function (page 119).

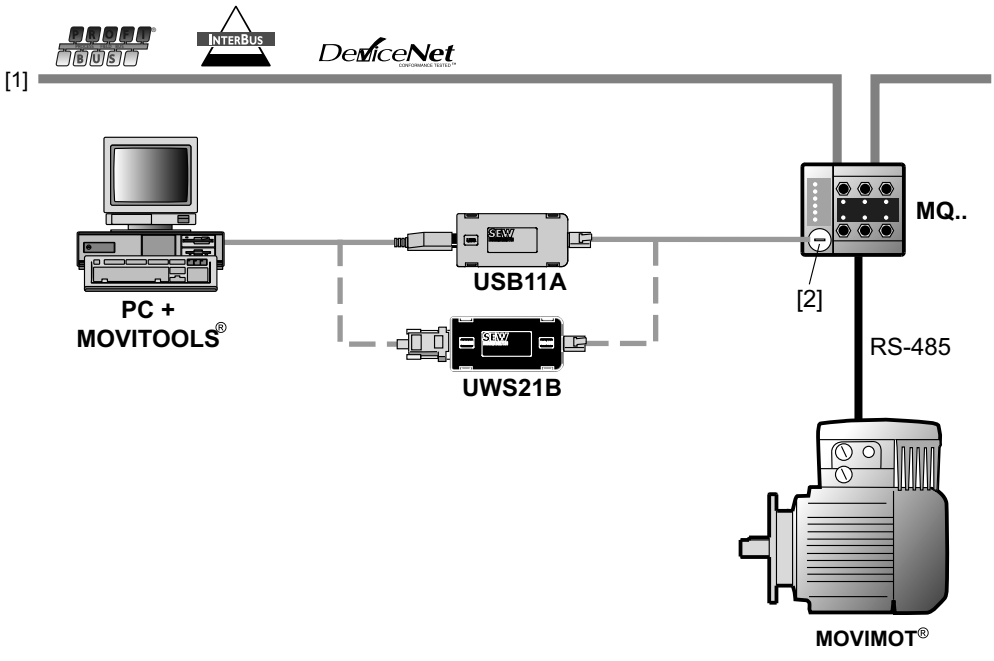
Additional function 4 is only designed for RS-485 control in combination with the MQ.. fieldbus interfaces with integrated minicontroller.

For more information, refer to the respective fieldbus manual.

Functional description

The potentiometer f1 and switches f2 and t1 are deactivated. The MOVIMOT® inverter ignores the settings of the potentiometer and the switches. The MOVIMOT® inverter continues to read the setting of the DIP switches. Functions that are changed using the DIP switches cannot be changed via bus.

Block diagram



9007199586873099

[1] Fieldbus
[2] Diagnostic interface

Changing parameters in MOVITOOLS® MotionStudio

After opening MOVITOOLS® MotionStudio / Startup/ Parameter tree, the following parameters are accessible. They can be changed and saved in the unit.

Name	Section	Index	Parameter	Step width
Ramp up	0.1 – **1** – 2000 [s]	8807	130	0.1 s – 1 s: 0.01 1 s – 10 s: 0.1 10 s – 100 s: 1 100 s – 2000 s: 10
Ramp down	0.1 – **1** – 2000 [s]	8808	131	
Minimum frequency	**2 –** 100 [Hz]	8899	305	0.1
Maximum frequency[1)]	2 – **100** [Hz]	8900	306	0.1
Current limit	60 – **160** [%]	8518	303	1
Pre-magnetization time	0 – **0.4 –** 2 [s]	8526	323	0.001
Post-magnetization time	0 – **0.2 –** 2 [s]	8585	732	0.001
Parameter lock	**0: Off** 1: On	8595	803	–
Factory setting	**0: No** 2: Delivery state	8594	802	–
Speed monitoring delay time	0.1 – **1** – 10.0 [s]	8558	501	0.1
Brake release time	**0 –** 2 [s]	8749	731	0.001
Slip compensation[2)]	0 – 500 [rpm]	8527	324	0.2

Factory setting = **bold**

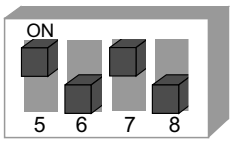
1) Example: Maximum frequency = 60 Hz
Bus setpoint = 10 %
Frequency setpoint = 6 Hz

2) The value will be set to the nominal motor slip when there is a change in the additional function setting.

- The factory setting is activated as soon as additional function 4 is activated via DIP switches. If the additional function which was selected via DIP switches remains unchanged after the 24 V operating voltage is switched off, the last valid values from the EEPROM will be used after reactivation.
- The start frequency is fixed at 0.5 Hz.
- If the set setpoint or maximum frequency is lower than the set minimum frequency, the minimum frequency becomes active.
- The parameters are only evaluated with this additional function.

6.7.6 Additional function 5

MOVIMOT® motor protection via TH



S2

329992459

INFORMATION

The additional function is only designed for RS-485 control when the MOVIMOT® inverter is installed close to the motor.

Functional description

Functions in connection with fieldbus interfaces MF.. and MQ..:

- When the MOVIMOT® inverter is mounted close to the motor, the TH sets the terminals "R" and "L" to "0" in case of motor overtemperature.
- Additional function 5 generates error 84 (motor overtemperature) when terminals "R" or "L" are opened.
- Error 84 is indicated by the flashing status LED of the MOVIMOT® inverter.
- The generated error 84 is also transmitted via fieldbus.

Functions in combination with fieldbus interface MQ..:

- MOVIMOT® bus configuration according to additional function 4 (page 71).

Functions in combination with fieldbus interface MF..:

- The potentiometer f1 and switches f2 and t1 are deactivated. The following values apply:

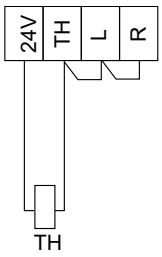
Name	Value
Ramp up	1 s
Ramp down	1 s
Minimum frequency	2 Hz
Maximum frequency	100 Hz
Current limit	Default current limit
Pre-magnetization time	0.4 s
Post-magnetization time	0.2 s
Speed monitoring delay time	1 s
Brake release time	0 s
Slip compensation	Nominal motor slip

Tripping conditions for error S84

Error 84 "Motor overtemperature" is triggered when **all** the following conditions are fulfilled:

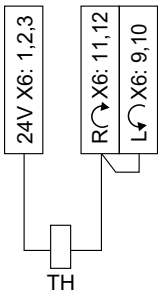
- The standard MOVIMOT® motor protection function via DIP switch S1/5 = "ON" is deactivated.
- The terminals for direction of rotation are connected to 24 V via a TH as in the following figure.

For field distributors:



332178315

For mounting close to the motor
With option P2.A:



626745483

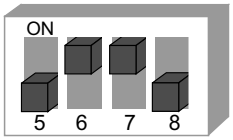
- The TH tripped due to motor overtemperature. The enable signal for the two direction of rotation terminals is cancelled.
- Supply voltage is connected.

INFORMATION

If only the 24 V supply voltage is present at the MOVIMOT® inverter, the error is not tripped.

6.7.7 Additional function 6

MOVIMOT® with maximum 8 kHz PWM frequency



S2

330028171

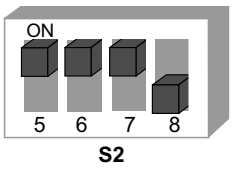
Functional description

- This additional function reduces the PWM frequency from 16 kHz to 8 kHz.
- When DIP switch S1/7 is set to "ON", the unit operates with an 8 kHz PWM frequency and switches back to 4 kHz depending on the heat sink temperature.

	S1/7 <u>without</u> additional function 6	S1/7 <u>with</u> additional function 6
ON	PWM frequency variable 16, 8, 4 kHz	PWM frequency variable 8, 4 kHz
OFF	PWM frequency 4 kHz	PWM frequency 4 kHz

6.7.8 Additional function 7

MOVIMOT® with rapid start / stop



330064651

Functional description

"Rapid start" sub-function (with RS-485 control + binary control)

- The pre-magnetization time is set to 0 s.
- Pre-magnetization is not performed after the drive is enabled. This is necessary to start acceleration along the setpoint ramp as quickly as possible.

"Rapid stop" sub-function (only with RS-485 control)

- The "rapid stop" function (applying brake when downward ramp is activated) is introduced for control via RS-485. This function is assigned to bit 9 in the control word as virtual terminal in line with the MOVILINK® profile.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
not assigned[1]						**Bit "9"**	Bit "8"	Not assigned[1]	"1" = Reset	Not assigned[1]			"1 1 0" = Enable otherwise stop		

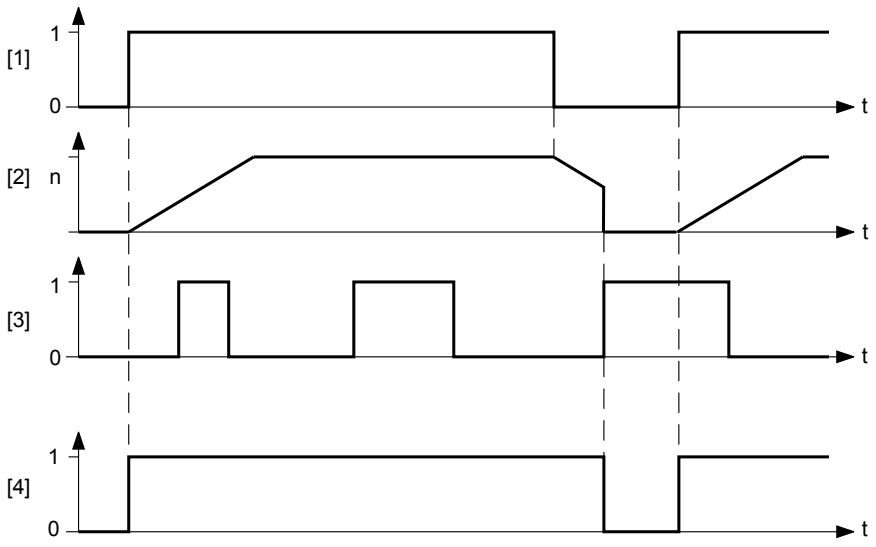
Brake can be released without enable

Virtual terminal for "Applying brake when downward ramp is activated"

1) Recommendation for all bits that are not assigned = "0"

- Upon setting bit 9 during the downward ramp, the MOVIMOT® inverter applies the brake (directly via brake output or via the MOVIMOT® signal relay output) and inhibits the output stage.
- If the motor frequency is lower than the stop frequency, the brake is applied regardless of the state of bit 9.
- After having activated rapid stop, do not enable the drive until it has reached standstill.

Flow diagram for brake control with "rapid stop" sub-function: (control via RS-485):



333149963

[1] Enable terminals / control word
[2] Speed
[3] Bit 9
[4] Brake control signal: 1 = released, 0 = applied

Brake control (control via RS-485 + binary control)

Mechanical brake controlled by MOVIMOT® inverter:

- The terminals X1:13, X1:14, and X1:15 in the MOVIMOT® connection box are assigned to the brake coil of the mechanical brake. You must not connect an additional braking resistor to terminals X1:13 and X1:15.
- The relay is switched as a ready relay (standard function).

Mechanical brake controlled by the relay output or the BEM/BES option:

⚠ WARNING

Risk of crushing due to unintentional startup of the drive caused by incorrect settings of the DIP switches S2/5 – S2/8. Nonobservance of the chapter "Using the relay output for additional functions 7, 9, 12 and 13" (page 90) may lead to the brake being released.

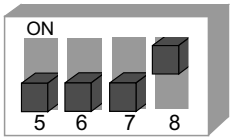
Severe or fatal injuries.

- Observe the information in chapter "Using the relay output for additional functions 7, 9, 12 and 13" (page 90).

- A braking resistor (BW..) must be connected to terminals X1:13 and X1:15 in the MOVIMOT® connection box. Terminal X1:14 is not assigned.
- Relay K1 acts as brake control relay. This means that the ready signal function is no longer available.

6.7.9 Additional function 8

MOVIMOT® with minimum frequency 0 Hz



S2

330101899

Functional description

Control via RS-485:

In detent position 0 of switch f2, the minimum frequency with the activated additional function is 0 Hz. All other values that can be set remain unchanged.

Switch f2											
Detent setting	**0**	1	2	3	4	5	6	7	8	9	10
Minimum frequency [Hz] with active additional function	**0**	5	7	10	12	15	20	25	30	35	40
Minimum frequency [Hz] without additional function	**2**	5	7	10	12	15	20	25	30	35	40

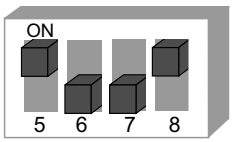
Binary control:

In detent position 0 of switch f2, the setpoint f2 with the activated additional function is 0 Hz. All other values that can be set remain unchanged.

Switch f2											
Detent setting	**0**	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz] with active additional function	0	7	10	15	20	25	35	50	60	70	100
Setpoint f2 [Hz] without additional function	**5**	7	10	15	20	25	35	50	60	70	100

6.7.10 Additional function 9

MOVIMOT® for hoist applications



S2

330140427

⚠ WARNING

Risk of fatal injury if the hoist falls.

Severe or fatal injuries.

- MOVIPRO® may not be used as a safety device in hoist applications.
- Use monitoring systems or mechanical protection devices to ensure safety.

NOTICE

System overload due to operation of the MOVIMOT® drive at the current limit.

Damage to the inverter.

- Activate the speed monitoring function. If the MOVIMOT® drive is operated at the current limit for longer than 1 s, it will trigger the error message F08 "speed monitoring".

Requirements

MOVIMOT® can only be used in hoist applications if the following requirements are met:

- Additional function 9 is only possible in conjunction with brakemotors.
- Make sure that the DIP switch S2/3 is set to "OFF" (VFC operation).
- It is mandatory to use a brake controller in connection with an external braking resistor.
- Activate the "speed monitoring" function (page 66) (DIP switch S2/4 = "ON").

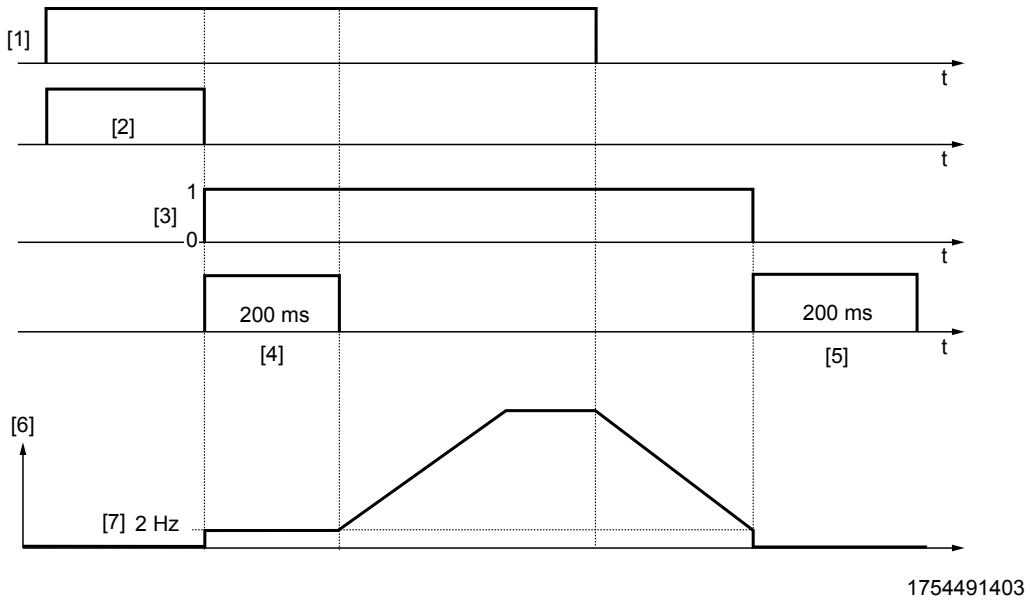
Functional description

- The start frequency for binary control mode and RS-485 control mode is 2 Hz. If the function is not activated, the start frequency is 0.5 Hz.
- The brake release time is set to 200 ms (standard = 0 ms) This setting prevents the motor from working against the brake.
- The brake application time (post-magnetization time) is fixed to 200 ms. This setting ensures that the brake is applied as soon as the motor stops generating torque.
- The K1 relay is assigned the "Brake released" function.

  When the K1 relay is open, the brake stops the motor.

  When the K1 relay is closed, the brake is released.

Overview of brake control with additional function 9 (control via RS-485 + binary control):



1754491403

[1] Enable
[2] Pre-magnetization time
[3] Brake control signal "1" = released, "0" = applied
[4] Brake release time
[5] Brake application time (post-magnetization time)
[6] Frequency
[7] Stop frequency = Start / minimum frequency

The mechanical brake is controlled by the relay output or the BEM/BES option.

⚠ WARNING

Risk of crushing due to unintentional startup of the drive caused by incorrect settings of the DIP switches S2/5 – S2/8. Nonobservance of the chapter "Using the relay output for additional functions 7, 9, 12 and 13" (page 90) may lead to the brake being released.

Severe or fatal injuries.

- Observe the information in chapter "Using the relay output for additional functions 7, 9, 12 and 13" (page 90).

- A braking resistor (BW..) must be connected to terminals X1:13 and X1:15 in the MOVIMOT® connection box. Terminal X1:14 is not assigned.
- Relay K1 acts as brake control relay. This means that the ready signal function is no longer available.

INFORMATION

The function "Brake release without enable" is not available in hoist operation.

"Rapid stop" sub-function (only with RS-485 control)

- The "rapid stop" function (applying brake when downward ramp is activated) is introduced for control via RS-485. This function is assigned to bit 9 in the control word as virtual terminal in line with the MOVILINK® profile.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

not assigned[1)]	**Bit "9"**	Bit "8"	Not assigned[1)]	"1" = Reset	Not assigned[1)]	"1 1 0" = Enable otherwise stop

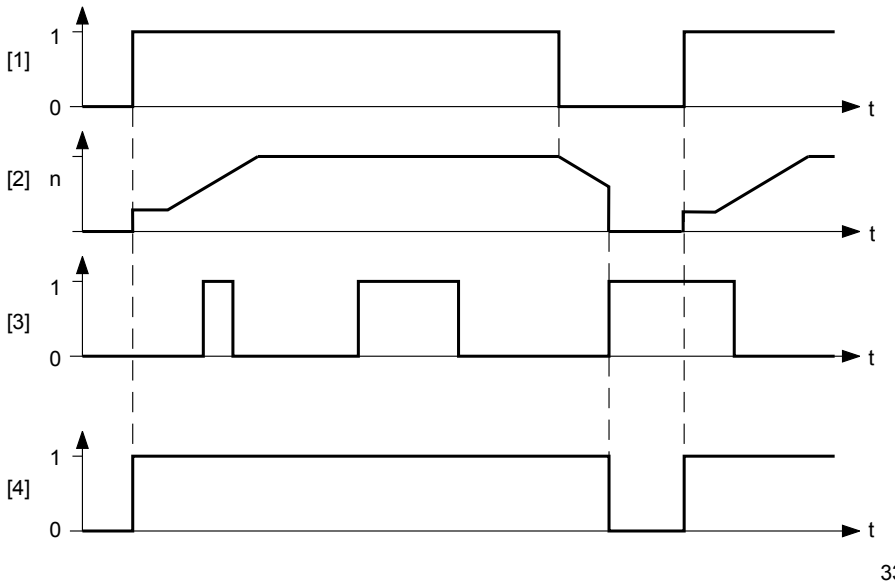
Brake can be released without enable

Virtual terminal for "Applying brake when downward ramp is activated"

1) Recommendation for all bits that are not assigned = "0"

- Upon setting bit 9 during the downward ramp, the MOVIMOT® inverter applies the brake (directly via brake output or via the MOVIMOT® signal relay output) and inhibits the output stage.
- If the motor frequency is lower than the stop frequency, the brake is applied regardless of the state of bit 9.
- After having activated rapid stop, do not enable the drive until it has reached standstill.

Flow diagram for brake control with "rapid stop" sub-function: (control via RS-485):



334493195

[1] Enable terminals / control word
[2] Speed
[3] Bit 9
[4] Brake control signal: "1" = released, "0" = applied

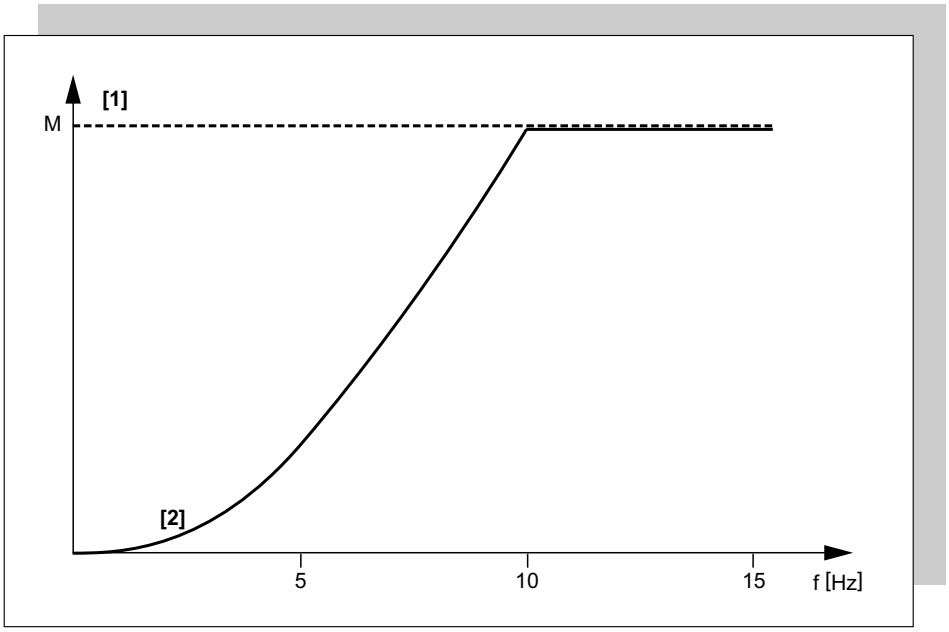
6.7.11 Additional function 10

MOVIMOT® with reduced torque at low frequencies

330179211

Functional description

- Through reducing the slip compensation and active current at low speeds, the drive only develops a reduced torque (see the illustration which follows):
- Minimum frequency = 0 Hz, see additional function 8 (page 77).



334866315

[1] Maximum torque in VFC mode
[2] Maximum torque when additional function 10 is activated

6.7.12 Additional function 11

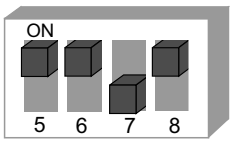
Deactivating the mains phase failure monitoring

NOTICE

Deactivating the mains phase failure monitoring can damage the unit if conditions are unfavorable.

Damage to the inverter.

- Deactivate the phase failure monitoring function only in case of brief asymmetries in the line voltage.
- Make sure that the MOVIMOT® drive is always connected to all 3 phases of the supply system.



S2

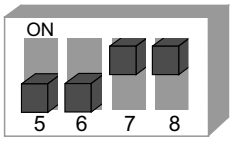
330218763

Functional description

- When the additional function is activated, the phases are not monitored.
- This makes sense for supply systems with short-term asymmetries.

6.7.13 Additional function 12

MOVIMOT® with rapid start / stop and motor protection via TH



S2

330259595

Functional description

- When the MOVIMOT® inverter is installed close to the motor, the additional function includes the following features:
  - Motor protection via indirect TH evaluation via direction of rotation terminals
  - Rapid start and stop function

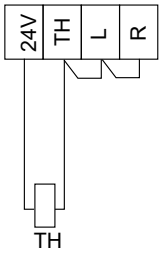
Sub-function "Motor protection via TH evaluation"

This function is only active in RS-485 control mode. This additional function causes a tripping of error 84 "Motor overtemperature".

Error 84 "Motor overtemperature" is triggered when all the following conditions are fulfilled:

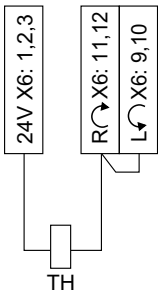
- The standard MOVIMOT® motor protection function via DIP switch S1/5 = "ON" is deactivated.
- The terminals for direction of rotation are connected to 24 V via a TH as in the following figure.

For field distributors:



332178315

For mounting close to the motor
With option P2.A:



626745483

- The TH tripped due to motor overtemperature. The enable signal for the two direction of rotation terminals is cancelled.
- Supply voltage is connected.

INFORMATION

The "motor protection function using TH evaluation" can be deactivated by setting the DIP switch S1/5 = "OFF". In this case, the motor protection in the MOVIMOT® inverter realized via a motor model is active.

"Rapid start" sub-function (RS-485 control + binary control)

- The pre-magnetization time is set to 0 s.
- Pre-magnetization is not performed after the drive is enabled. This is necessary to start acceleration along the setpoint ramp as quickly as possible.

"Rapid stop" sub-function (only with RS-485 control)

- The function "Applying brake when downward ramp is activated" is introduced for control via RS-485. This function is assigned to bit 9 in the control word as virtual terminal in line with the MOVILINK® profile.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
not assigned[1)]						**Bit "9"**	Bit "8"	Not assigned[1)]	"1" = Reset	Not assigned[1)]			"1 1 0" = Enable otherwise stop		

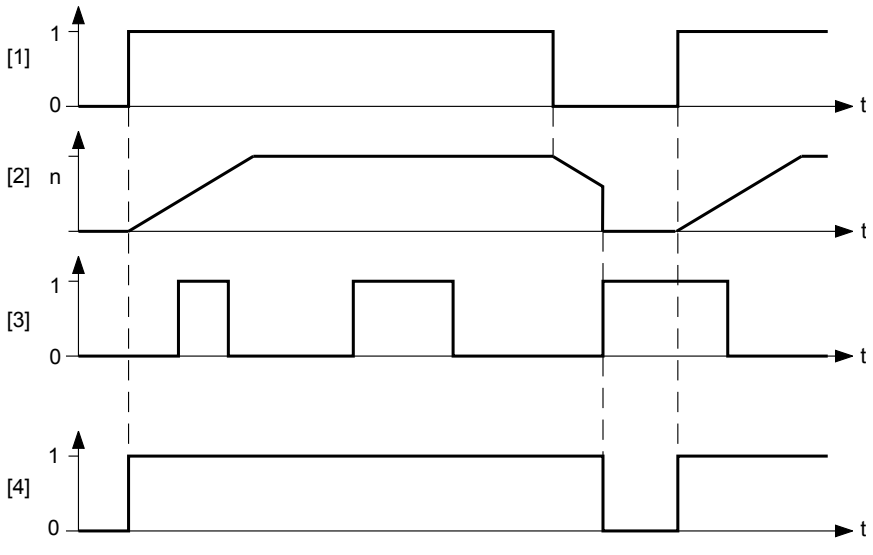
Brake can be released without enable

Virtual terminal for "Applying brake when downward ramp is activated"

1) Recommendation for all bits that are not assigned = "0"

- Upon setting bit 9 during the downward ramp, the MOVIMOT® inverter applies the brake (directly via brake output or via the MOVIMOT® signal relay output) and inhibits the output stage.
- If the motor frequency is lower than the stop frequency, the brake is applied regardless of the state of bit 9 during the downward ramp.
- After having activated rapid stop, do not enable the drive until it has reached standstill.

Flow diagram for brake control with "rapid stop" sub-function (control via RS-485):



334918283

[1] Enable terminals / control word
[2] Speed
[3] Bit 9
[4] Brake control signal: "1" = released, "0" = applied

Brake control (control via RS-485 + binary control)

Mechanical brake controlled by MOVIMOT® inverter:

- The terminals X1:13, X1:14, and X1:15 in the MOVIMOT® connection box are assigned to the brake coil of the mechanical brake. You must not connect an additional braking resistor to terminals X1:13 and X1:15.
- The relay is switched as a ready relay (standard function).

Mechanical brake controlled by the relay output or the BEM/BES option:

⚠ WARNING

Risk of crushing due to unintentional startup of the drive caused by incorrect settings of the DIP switches S2/5 – S2/8. Nonobservance of the chapter "Using the relay output for additional functions 7, 9, 12 and 13" (page 90) may lead to the brake being released.

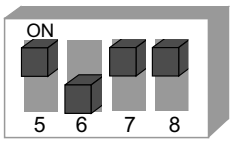
Severe or fatal injuries.

- Observe the information in chapter "Using the relay output for additional functions 7, 9, 12 and 13" (page 90).

- A braking resistor (BW..) must be connected to terminals X1:13 and X1:15 in the MOVIMOT® connection box. Terminal X1:14 is not assigned.
- Relay K1 acts as brake control relay. This means that the ready signal function is no longer available.

6.7.14 Additional function 13

MOVIMOT® with extended speed monitoring function



330300683

⚠ WARNING

Risk of fatal injury if the hoist falls.

Severe or fatal injuries.

- MOVIPRO® may not be used as a safety device in hoist applications.
- Use monitoring systems or mechanical protection devices to ensure safety.

Requirements

MOVIMOT® can only be used in hoist applications if the following requirements are met:

- Additional function 13 is only possible in conjunction with brakemotors.
- Make sure that the DIP switch S2/3 is set to "OFF" (VFC operation).
- It is mandatory to use a brake controller in connection with an external braking resistor.
- Observe the descriptions and notes for additional function 9 (page 78).

Functional description

Additional function 13 includes the following functions:

- Additional function 9, MOVIMOT® for hoist applications (page 78)
- Speed monitoring with adjustable monitoring time

Once additional function 13 is activated, speed monitoring is always on, regardless of the setting of DIP switch S2/4.

After activating additional function 13, the DIP switch S2/4 has the following functions depending on the set RS-485 address:

Binary control

The RS-485 address set at DIP switches S1/1 to S1/4 is 0.

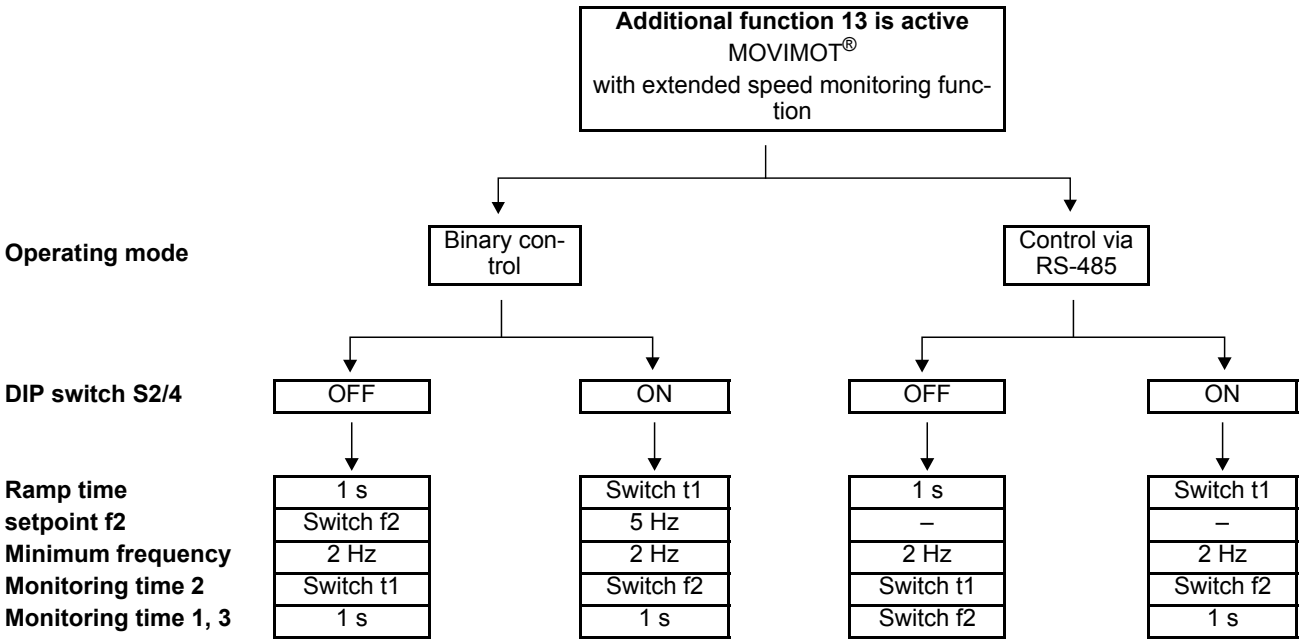
- S2/4 = "OFF"
  - The speed monitoring time 2 is set at switch t1.
  - The speed monitoring times 1 and 3 are fixed to 1 s.
  - The ramp time is fixed to 1 s.
  - Setpoint f2 is set as switch f2.
- S2/4 = "ON"
  - The speed monitoring time 2 is set at switch f2.
  - The speed monitoring times 1 and 3 are fixed to 1 s.
  - The setpoint is fixed at 5 Hz.
  - The ramp time is set at switch t1.

Control via RS-485

The RS-485 address set at DIP switches S1/1 to S1/4 is not 0.

- S2/4 = "OFF"
  - The speed monitoring time 2 is set at switch t1.
  - The speed monitoring times 1 and 3 are set at switch f2.
  - The ramp time is fixed to 1 s.
  - The minimum frequency is fixed at 2 Hz.
- S2/4 = "ON"
  - The speed monitoring time 2 is set at switch f2.
  - The speed monitoring times 1 and 3 are fixed to 1 s.
  - The ramp time is set at switch t1.
  - The minimum frequency is fixed at 2 Hz.

Setting options for additional function 13

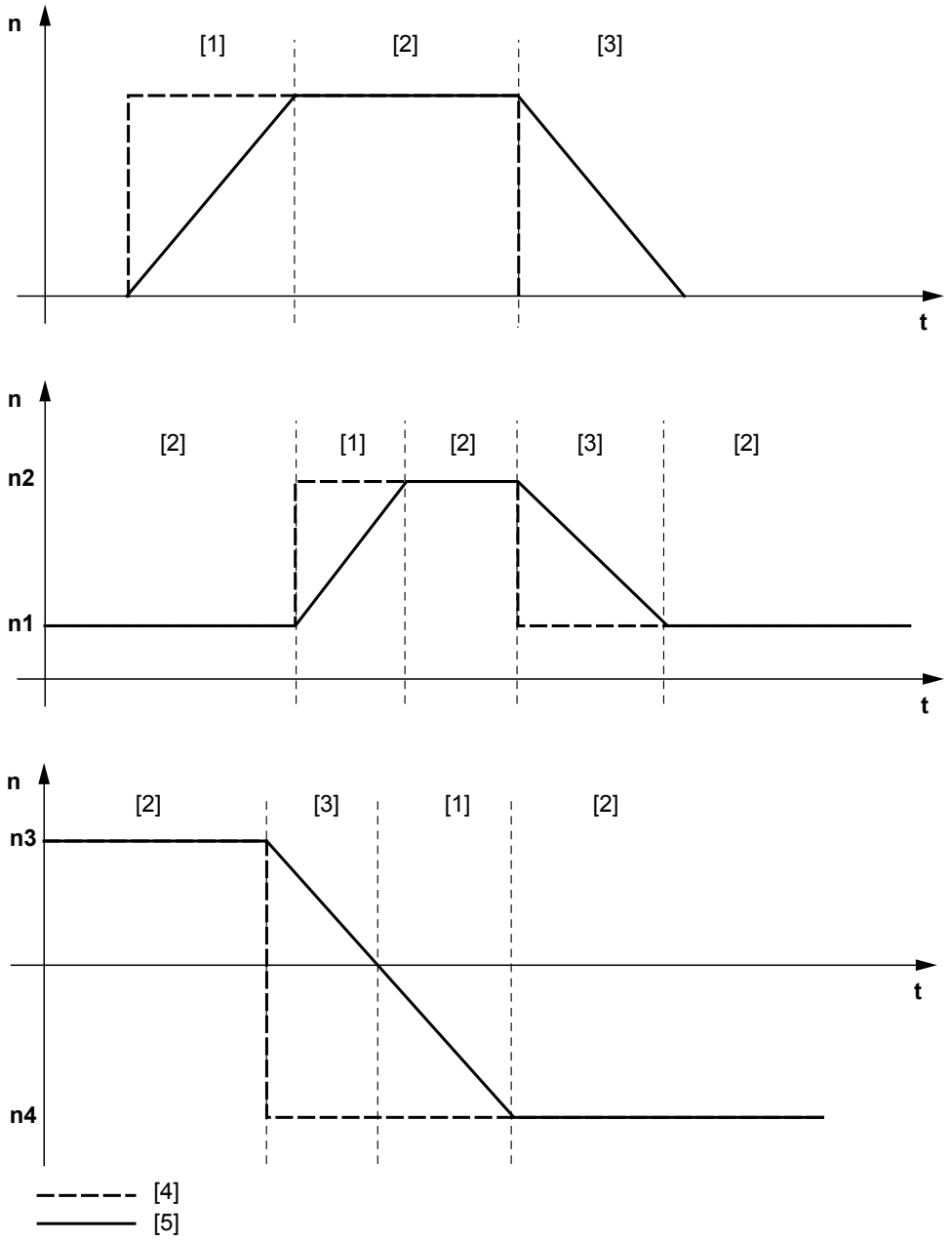


Setting the speed monitoring times

When additional function 13 is active, the following values may be set as monitoring times on switches t1 and f2:

Switch t1 or f2 (see above)											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Monitoring time 2 [s]	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.5
Monitoring times 1 and 3 [s]	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.5

Validity of the speed monitoring times



9007199591797259

[1] Validity of monitoring time 1
[2] Validity of monitoring time 2
[3] Validity of monitoring time 3
[4] Speed setpoint
[5] Speed output (actual value)

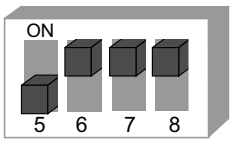
Monitoring time 1 is valid when the actual speed increases after a setpoint change.

The validity range of monitoring time 2 begins when the setpoint is reached.

The validity range of monitoring time 3 applies when the actual speed decreases after a setpoint change.

6.7.15 Additional function 14

MOVIMOT® with deactivated slip compensation



S2

330342539

Functional description

Slip compensation is deactivated.

Deactivating slip compensation can reduce the speed accuracy of the motor.

6.7.16 Using the relay output for additional functions 7, 9, 12 and 13

⚠ WARNING

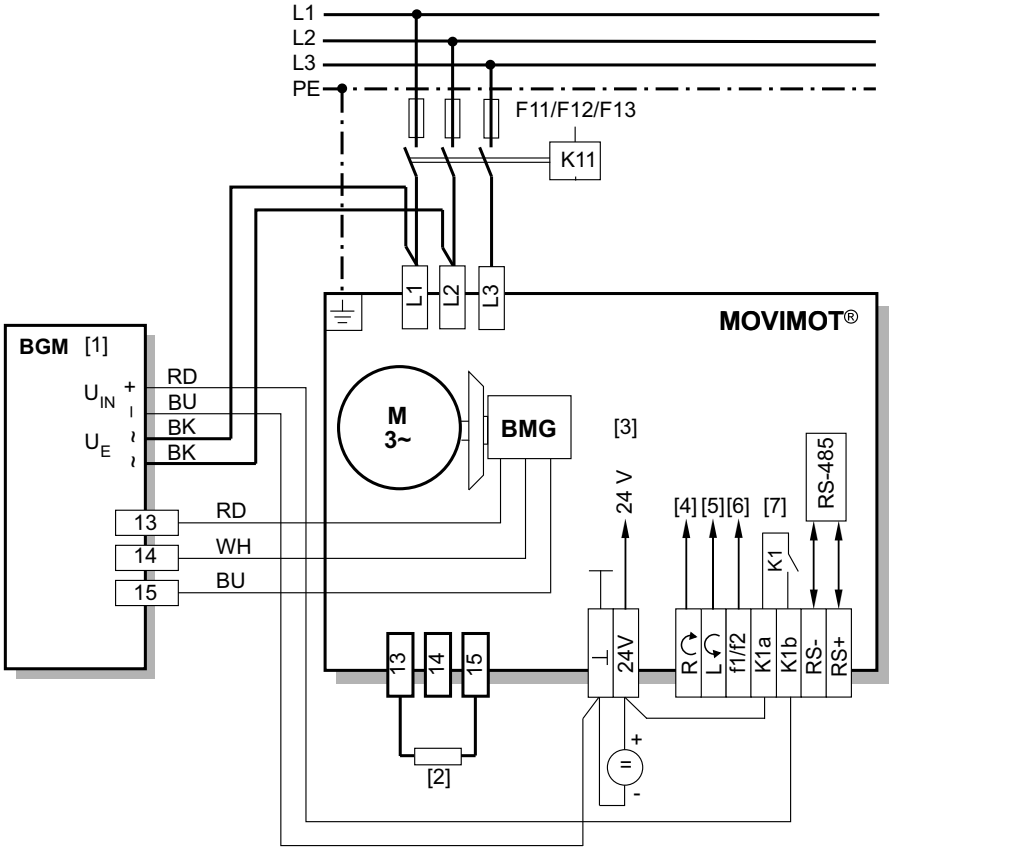
Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

Note the following points before performing startup with brake controller BGM:

- The brake coil must correspond with the supply voltage (e.g. 400 V).
- Terminal X1:14 must not be assigned.
- One of the additional functions 7, 9, 12 or 13 must be activated as otherwise the brake is released permanently. This must be considered also when replacing the MOVIMOT® inverter.
  If none of these functions is activated, the relay contact K1 acts as ready signal contact. This means that the brake is released without enable signal when using the BGM option.

The following figure shows the use of relay contact K1 for controlling the mechanical brake via the BGM brake rectifier.



2001188491

[1] BGM brake control mounted in the connection box
[2] External BW braking resistor (for assignment, see sec. "Technical Data")
[3] DC 24 V supply
[4] CW/stop
[5] CCW/stop
Observe the enabled direction of rotation, see chapter "Connection of the MOVIMOT® drive" (page 36)
[6] Setpoint changeover f1/f2
[7] Brake relay

6.8 Startup with binary control

⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.

Severe or fatal injuries.

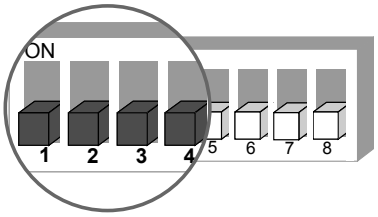
- De-energize the MOVIMOT® drive using a suitable cut-off device before removing the MOVIMOT® inverter.
- Secure the inverter against unintended re-connection to the voltage supply.
- Wait for at least 1 minute before removing the inverter.

1. Check whether the MOVIMOT® drive is installed correctly both mechanically and electrically.

   See chapters "Mechanical Installation" and "Electrical Installation".

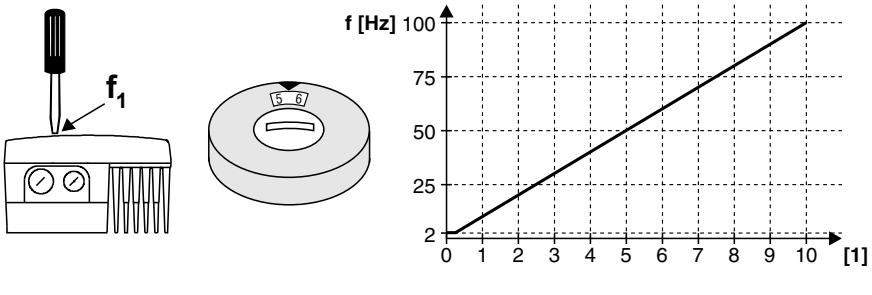
2. Make sure that the DIP switches S1/1 – S1/4 are set to "OFF" (address = 0).

   This means MOVIMOT® is controlled binary via terminals.



337484811

3. Set the first speed at the setpoint potentiometer f1 (active when terminals f1/f2 X6:7,8 = "0"), factory setting: about 50 Hz (1500 rpm).



329413003

[1] Potentiometer setting

4. Make sure the screw plug of the setpoint potentiometer f1 has a seal and screw it in.

   NOTICE Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

   Damage to the MOVIMOT® inverter.

   - Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

5. Set the 2nd speed at switch f2 (active when terminals f1/f2 X6, 7, 8 = "1").

Switch f2											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz]	5	7	10	15	20	25	35	50	60	70	100

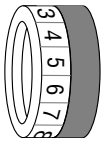
INFORMATION

The first speed can be changed infinitely variable during operation using the setpoint potentiometer f1, which is accessible from the outside.

Speeds f1 and f2 can be set independently of each other.

6. Set the ramp time at the switch t1.

   The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).



Switch t1											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

7. Place the MOVIMOT® inverter onto the connection box and screw it on.
8. Switch on the DC 24 V and the supply system voltage.

6.8.1 Inverter behavior depending on terminal level

The following table shows the behavior of the MOVIMOT® inverter subject to the level at the control terminals:

Inverter behavior	Terminal level					Status LED
	Supply system X1:L1 – L3	24V X6:1,2,3	f1/f2 X6:7,8	CW/stop X6:11,12	CCW/stop X6:9,10	
Inverter off	0	0	X	X	X	Off
Inverter off	1	0	X	X	X	Off
Stop, no supply system	0	1	X	X	X	Flashing yellow
Stop	1	1	X	0	0	Yellow
CW operation with f1	1	1	0	1	0	Green
CCW operation with f1	1	1	0	0	1	Green
CW operation with f2	1	1	1	1	0	Green
CCW operation with f2	1	1	1	0	1	Green
Stop	1	1	x	1	1	Yellow

Key:

0 = No voltage
1 = Voltage
X = Any

6.9 Startup with options MBG11A or MLG..A

⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.

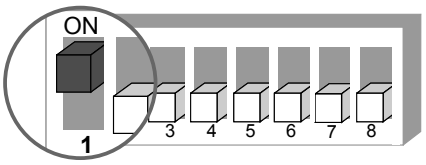
Severe or fatal injuries.

- De-energize the MOVIMOT® drive using a suitable cut-off device before removing the MOVIMOT® inverter.
- Secure the inverter against unintended re-connection to the voltage supply.
- Wait for at least 1 minute before removing the inverter.

1. Check whether the MOVIMOT® drive is installed correctly both mechanically and electrically.

   See chapters "Mechanical Installation" and "Electrical Installation".

2. Set DIP switch S1/1 of the MOVIMOT® to "ON" (= address 1).



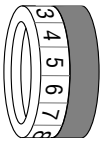
337783947

3. Set minimum frequency f_{min} with switch f2.

Switch f2											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

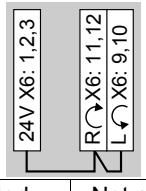
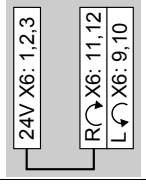
4. Set the ramp time at the switch t1.

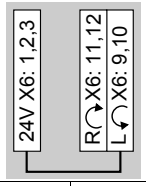
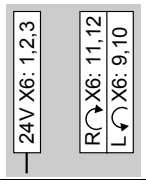
   The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).



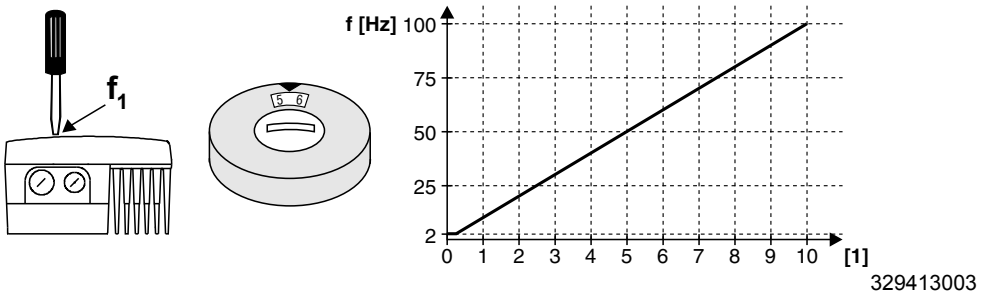
Switch t1											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

5. Check to see if requested direction of rotation has been enabled.

CW/stop	CCW/stop	Meaning
Activated	Activated	• Both directions of rotation are enabled.
		
Activated	Not activated	• Only CW operation is enabled. • Pre-selected setpoints for CCW rotation result in standstill of drive.
		

CW/stop	CCW/stop	Meaning
Not activated	Activated	• Only CCW operation is enabled. • Pre-selected setpoints for CW rotation result in stand-still of drive.
		
Not activated	Not activated	• The unit is inhibited or the drive is brought to a stop.
		

6. Place the MOVIMOT® inverter onto the connection box and screw it on.
7. Set the required maximum speed using setpoint potentiometer f1.



329413003

[1] Potentiometer setting

8. Make sure the screw plug of the setpoint potentiometer f1 has a seal and screw it in.

   NOTICE Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

   Damage to the MOVIMOT® inverter.

   - Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.
9. Switch on the DC 24 V control voltage and the supply system voltage.

INFORMATION

For notes on operation with the MBG11A or MLG..A options, refer to sec. "Keypads MBG11A and MLG..A" (page 153).

6.10 Startup with MWA21A option

⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.

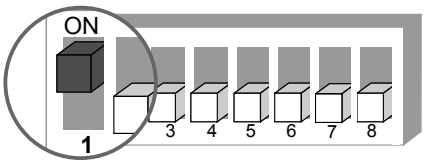
Severe or fatal injuries.

- De-energize the MOVIMOT® drive using a suitable cut-off device before removing the MOVIMOT® inverter.
- Secure the inverter against unintended re-connection to the voltage supply.
- Wait for at least 1 minute before removing the inverter.

1. Check whether the MOVIMOT® drive is installed correctly both mechanically and electrically.

   See chapters "Mechanical Installation" and "Electrical Installation".

2. Set DIP switch S1/1 of the MOVIMOT® to "ON" (= address 1).



337783947

3. Set minimum frequency f_{min} with switch f2.

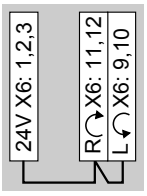
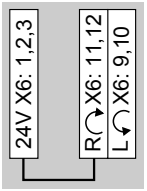
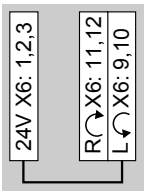
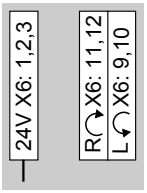
Switch f2											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

4. Set the ramp time at the switch t1.

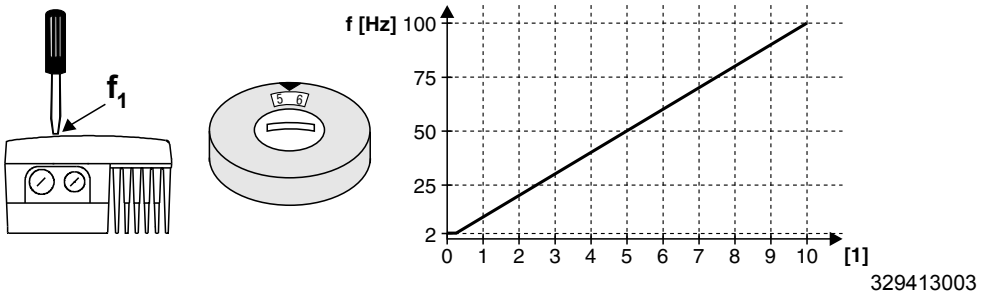
   The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).

Switch t1											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

5. Check to see if requested direction of rotation has been enabled.

CW/stop	CCW/stop	Meaning
Activated	Activated	• Both directions of rotation are enabled.
		
Activated	Not activated	• Only CW operation is enabled. • Pre-selected setpoints for CCW rotation result in standstill of drive.
		
Not activated	Activated	• Only CCW operation is enabled. • Pre-selected setpoints for CW rotation result in standstill of drive.
		
Not activated	Not activated	• The unit is inhibited or the drive is brought to a stop.
		

6. Place the MOVIMOT® inverter onto the connection box and screw it on.
7. Set the required maximum speed using setpoint potentiometer f1.



329413003

[1] Potentiometer setting

8. Make sure the screw plug of the setpoint potentiometer f1 has a seal and screw it in.

   NOTICE Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

   Damage to the MOVIMOT® inverter.

   - Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

9. Select the signal type for the analog input (terminals 7 and 8) of the MWA21A option at the DIP switches S1 and S2.

	S1	S2	Setpoint stop function
U signal 0 – 10 V	OFF	OFF	No
I signal 0 – 20 mA	ON	OFF	
I signal 4 – 20 mA	ON	ON	Yes
U signal 2 – 10 V	OFF	ON	

10. Switch on the DC 24 V and the supply system voltage.
11. Enable the MOVIMOT® drive.

    by applying 24 V to terminal 4 (CW rotation) or terminal 5 (CCW rotation) of the MWA21A option.

INFORMATION

For notes on operation with the MWA21A option, refer to chapter "MWA21A setpoint converter" (page 154).

6.11 Startup with MWF11A option

⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.

Severe or fatal injuries.

- De-energize the MOVIMOT® drive using a suitable cut-off device before removing the MOVIMOT® inverter.
- Secure the inverter against unintended re-connection to the voltage supply.
- Wait for at least 1 minute before removing the inverter.

1. Check whether the MOVIMOT® drive is installed correctly as described in the chapters "Mechanical Installation" and "Electrical Installation".
2. Set the RS-485 address of the drive at DIP switches S1/1 – S1/4.

   Always set address "1" for "point-to-point" or "point-to-point with alternating 2PD/3PD" mode.

Decimal address	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S1/1	–	X	–	X	–	X	–	X	–	X	–	X	–	X	–	X
S1/2	–	–	X	X	–	–	X	X	–	–	X	X	–	–	X	X
S1/3	–	–	–	–	X	X	X	X	–	–	–	–	X	X	X	X
S1/4	–	–	–	–	–	–	–	–	X	X	X	X	X	X	X	X

X = ON
– = OFF

3. Set minimum frequency f_{min} with switch f2.

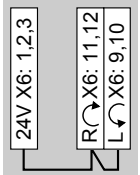
Switch f2											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

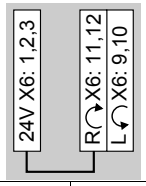
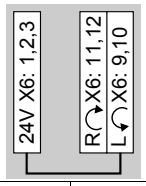
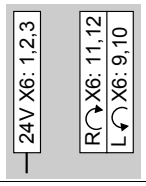
4. If the ramp time is not specified via the option, set the ramp time at switch t1.

   The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).

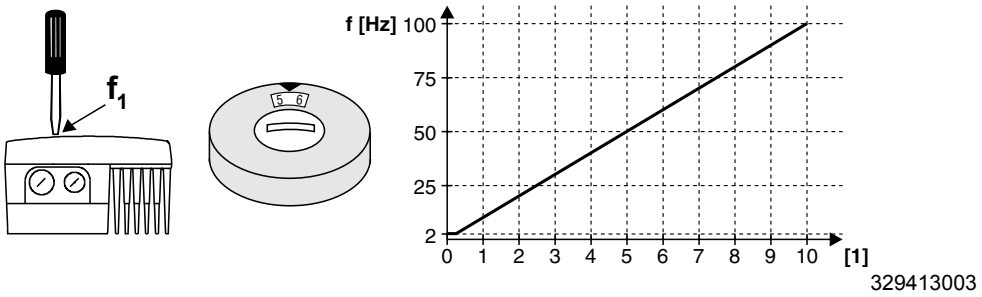
Switch t1											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

5. Check to see if requested direction of rotation has been enabled.

CW/stop	CCW/stop	Meaning
Activated	Activated	• Both directions of rotation are enabled.
		

CW/stop	CCW/stop	Meaning
Activated	Not activated	• Only CW operation is enabled. • Pre-selected setpoints for CCW rotation result in standstill of drive.
		
Not activated	Activated	• Only CCW operation is enabled. • Pre-selected setpoints for CW rotation result in standstill of drive.
		
Not activated	Not activated	• The unit is inhibited or the drive is brought to a stop.
		

6. Place the MOVIMOT® inverter onto the connection box and screw it on.
7. Set the required maximum speed using setpoint potentiometer f1.



[1] Potentiometer setting

8. Make sure the screw plug of the setpoint potentiometer f1 has a seal and screw it in.

   NOTICE Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

   Damage to the MOVIMOT® inverter.

   - Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.
9. Switch on the DC 24 V and the supply system voltage.

INFORMATION

For notes on operation with the MWF11A option, refer to chapter "MWF11A setpoint converter" (page 155).

6.12 Supplementary notes for installation close to the motor

When the MOVIMOT® inverter is installed close to the motor, observe the following notes:

6.12.1 Checking the connection type of the connected motor

Make sure that the selected connection type of MOVIMOT® inverter corresponds to that of the connected motor according to the illustration below.

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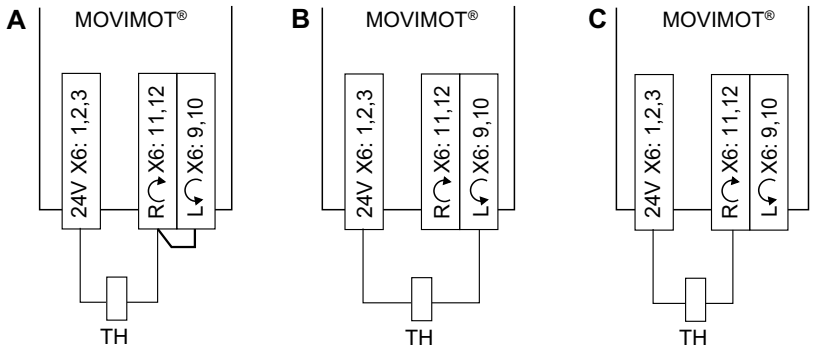
For brake motors: Do not install brake rectifiers inside the terminal box of the motor!

6.12.2 Motor protection and direction of rotation enable

The connected motor must be equipped with a TH.

- For control via RS-485, the TH must be wired as follows:



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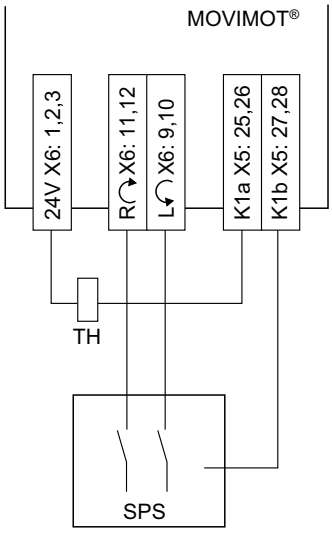
[A] Both directions of rotation are enabled
[B] Only **CCW** direction of rotation is enabled
[C] Only **CW** direction of rotation is enabled

- For control via binary signals, SEW-EURODRIVE recommends that you connect the TH in series with the "Ready signal" relay (see the following illustration).
  - The ready signal must be monitored by an external controller.
  - As soon as the ready signal is no longer present, the drive must be switched off (terminals R ↷ X6:11,12 and L ↶ X6:9,10 = "0").



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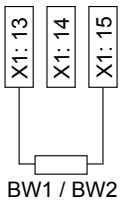
6.12.3 DIP switch

When the MOVIMOT® inverter is installed close to the motor, the DIP switch S1/5 must be changed from the factory setting to "ON":

S1	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Meaning	**Binary coding RS-485 unit address**				**Motor protection**	**Motor power rating**	**PWM frequency**	**No-load damping**
	2^0	**2^1**	**2^2**	**2^3**				
ON	1	1	1	1	Off	Motor one stage smaller	Variable (16, 8, 4 kHz)	On
OFF	**0**	**0**	**0**	**0**	**On**	**Adjusted**	**4 kHz**	**Off**

6.12.4 Braking resistor

- For **motors without brake**, a braking resistor must be connected in the MOVIMOT® connection box.



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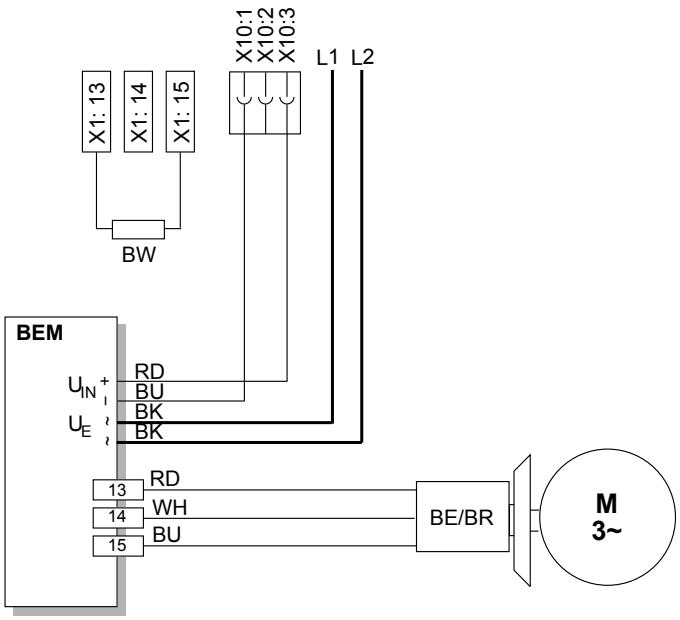
- For **brakemotors without BEM option**, no braking resistor may be connected to the MOVIMOT®.

- For **brakemotors with BEM option** and external braking resistor, the external braking resistor BW and the brake must be connected as follows.



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6.12.5 Mounting the MOVIMOT® inverter in the field distributor

Follow the instructions in the corresponding fieldbus manuals when mounting the MOVIMOT® inverter close to the motor in the field distributor.

7 "Easy" Startup with RS-485 Interface/Fieldbus

7.1 Important notes on startup

INFORMATION

You must comply with the general safety notes in chapter "Safety Notes" during startup.

⚠ WARNING

Risk of crushing due to missing or defective protective covers.

Severe or fatal injuries.

- Install the protective covers of the plant according to the instructions, also see the operating instructions of the gear unit.
- Never start up the MOVIMOT® drive if the protective covers are not installed.

⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.

Severe or fatal injuries.

- De-energize the MOVIMOT® drive using a suitable cut-off device before removing the MOVIMOT® inverter.
- Secure the inverter against unintended re-connection to the voltage supply.
- Wait for at least 1 minute before removing the inverter.

⚠ WARNING

Danger of burns due to hot surfaces of the MOVIMOT® drive (especially the heat sink) or external options.

Severe injuries.

- Do not touch the MOVIMOT® drive and external options until they have cooled down sufficiently.

⚠ WARNING

Unit malfunction due to incorrect unit setting.

Severe or fatal injuries.

- Observe the startup instructions.
- The installation must only be carried out by qualified personnel.
- Only use settings that are consistent with the function.

INFORMATION

To ensure fault-free operation, do not disconnect or connect power or signal cables during operation.

INFORMATION

- Remove paint protection cap from the status LED before startup.
- Remove paint protection film from the nameplates before startup.
- Observe a minimum switch-off time of 2 seconds for the line contactor K11.

7.2 Requirements

The following conditions apply to startup:

- The MOVIMOT® drive must be installed correctly both mechanically and electrically.
- Appropriate safety measures prevent the drives from starting up unintentionally.
- Appropriate safety measures must be taken to prevent risk of injury or damage to machine.

7.3 Startup procedure

⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.

Severe or fatal injuries.

- De-energize the MOVIMOT® drive using a suitable cut-off device before removing the MOVIMOT® inverter.
- Secure the inverter against unintended re-connection to the voltage supply.
- Wait for at least 1 minute before removing the inverter.

1. Check whether the MOVIMOT® drive is installed correctly both mechanically and electrically.

   See chapters "Mechanical Installation" and "Electrical Installation".

2. Set the correct RS-485 address on DIP switches S1/1 – S1/4.

   In conjunction with SEW fieldbus interfaces (MF.. / MQ..) or with MOVIFIT®, always set address "1".

Decimal address	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S1/1	–	X	–	X	–	X	–	X	–	X	–	X	–	X	–	X
S1/2	–	–	X	X	–	–	X	X	–	–	X	X	–	–	X	X
S1/3	–	–	–	–	X	X	X	X	–	–	–	–	X	X	X	X
S1/4	–	–	–	–	–	–	–	–	X	X	X	X	X	X	X	X

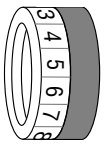
X = ON
– = OFF

3. Set minimum frequency f_{min} with switch f2.

Switch f2											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

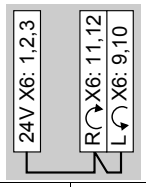
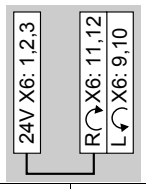
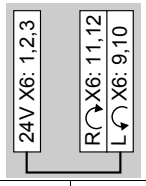
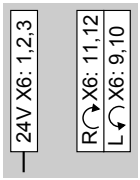
4. If the ramp is not specified via fieldbus, set the ramp time at switch t1.

   The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).

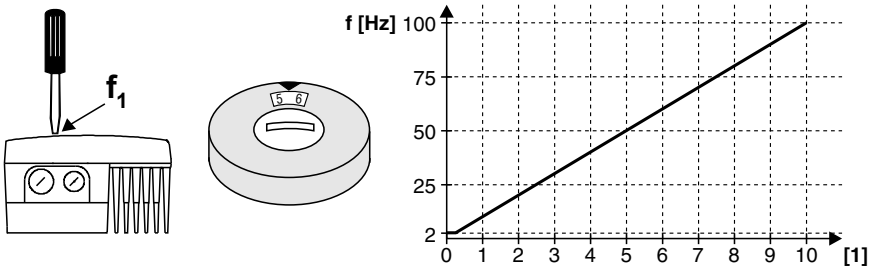


Switch t1											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

5. Check to see if requested direction of rotation has been enabled.

CW/stop	CCW/stop	Meaning
Activated	Activated	• Both directions of rotation are enabled
		
Activated	Not activated	• Only CW direction of rotation is enabled • Setting setpoints for CCW rotation will stop the drive
		
Not activated	Activated	• Only CCW direction of rotation is enabled • Setting setpoints for CW rotation will stop the drive
		
Not activated	Not activated	• Unit is inhibited or drive brought to a stop
		

6. Place the MOVIMOT® inverter onto the connection box and screw it on.
7. Set the required maximum speed using setpoint potentiometer f1.



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[1] Potentiometer setting

8. Make sure the screw plug of the setpoint potentiometer f1 has a seal and screw it in.

   NOTICE Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

   Damage to the MOVIMOT® inverter.

   - Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

9. Switch on the DC 24 V and the supply system voltage.

INFORMATION

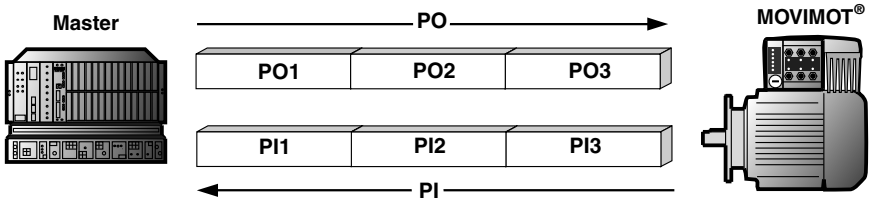
- For further information on the function in connection to the RS-485 master, refer to sec. "Function with RS-485 master" (page 111).
- For further information on the function in connection with fieldbus interfaces, refer to the relevant fieldbus manuals.

7.4 Coding of process data

The same process data information is used for control and setpoint setting in all fieldbus systems. The process data is coded according to the standard MOVILINK® profile for SEW drive inverters.

MOVIMOT® offers the following variants:

- 2 process data words (2 PD)
- 3 process data words (3 PD)



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PO	= Process output data	PI	= Process input data
PO1	= Control word	PI1	= Status word 1
PO2	= Speed [%]	PI2	= Output current
PO3	= Ramp	PI3	= Status word 2

7.4.1 2 process data words

For controlling the MOVIMOT® drive via 2 process data words, the higher-level controller sends the process output data "Control word" and "Speed [%]" to the MOVIMOT® inverter. The MOVIMOT® inverter sends the process input data "Status word 1" and "Output current" to the higher-level controller.

7.4.2 3 process data words

For control with 3 process data words, the "ramp" is sent as an additional process data output word and "Status word 2" is sent as the third process data input word.

7.4.3 Process output data

Process output data is sent from the higher-level controller to the MOVIMOT® inverter (control information and setpoints). However, they only become effective in the MOVIMOT® inverter if the RS-485 address in MOVIMOT® (DIP switches S1/1 to S1/4) is set to a value other than 0.

The higher-level controller controls the MOVIMOT® drive using the following process output data:

- PO1: Control word
- PO2: Speed [%] (setpoint)
- PO3: Ramp

Virtual terminal for applying brake and inhibiting output stage in case of "Stop" control command

Virtual terminals for releasing the brake without drive enable
Drive enable, only when DIP switch S2/2 = "ON"

	Basic control block															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
PO1: Control word	not assigned[1)] Reserved for special functions						Bit "9"	Bit "8"	Not assigned[1)]	"1" = Reset	Not assigned[1)]			"1 1 0" = Enable otherwise stop		
PO2: Setpoint	Signed percentage value / 0.0061 % **Example:** -80 % / 0.0061 % = - 13115 = $CCC5_{hex}$															
PO3: Ramp (only for 3-word protocol)	Time from 0 to 50 Hz in ms (range: 100 – 10000 ms) **Example:** 2.0 s = 2000 ms = $07D0_{hex}$															

1) Recommendation for all bits that are not assigned = "0"

Control word, bit 0 – 2

The "Enable" control command is specified with bits 0 – 2 by entering the control word = 0006_{hex}. To enable the MOVIMOT® inverter, you must also switch terminal R ↷ X6:11,12 and/or L ↶ X6:9,10 to +24 V (jumper with terminal 24V X6:1,2,3).

The "Stop" control command is issued by resetting bit 2 = "0." Use the stop command 0002_{hex} to ensure compatibility with other SEW inverter series. If bit 2 = "0", the MOVIMOT® inverter stops the drive with the current ramp.

Control word, bit 6 = reset

In the event of a malfunction, the fault can be acknowledged by setting bit 6 = "1" (Reset). Set unassigned control bits to "0" for compatibility reasons.

Control word, bit 8 = Release brake without drive enable

If DIP switch S2/2 = "ON", the brake can be released without drive enable by setting bit 8.

Control word, bit 9 = Apply brake when control command "Stop" is issued

If bit 9 is set after activating the control command "Stop", the MOVIMOT® inverter applies the brake and inhibits the output stage.

Speed [%]

The speed setpoint is given as a percentage and refers to maximum speed set at the setpoint potentiometer f1.

Coding: $C000_{hex}$ = -100 % (CCW rotation)
4000_{hex} = +100 % (CW rotation)
→ 1 digit = 0.0061 %

Example: 80 % f_{max}, CCW rotation:

Calculation: -80 % / 0.0061 = -13115_{dec} = $CCC5_{hex}$

Ramp

If process data is exchanged via three process data words, the current integrator ramp is transmitted in the process data output word PO3. The integrator ramp set with switch t1 is used if the MOVIMOT® inverter is controlled via two process data words.

Coding: → 1 digit = 1 ms

Range: 100 – 10000 ms

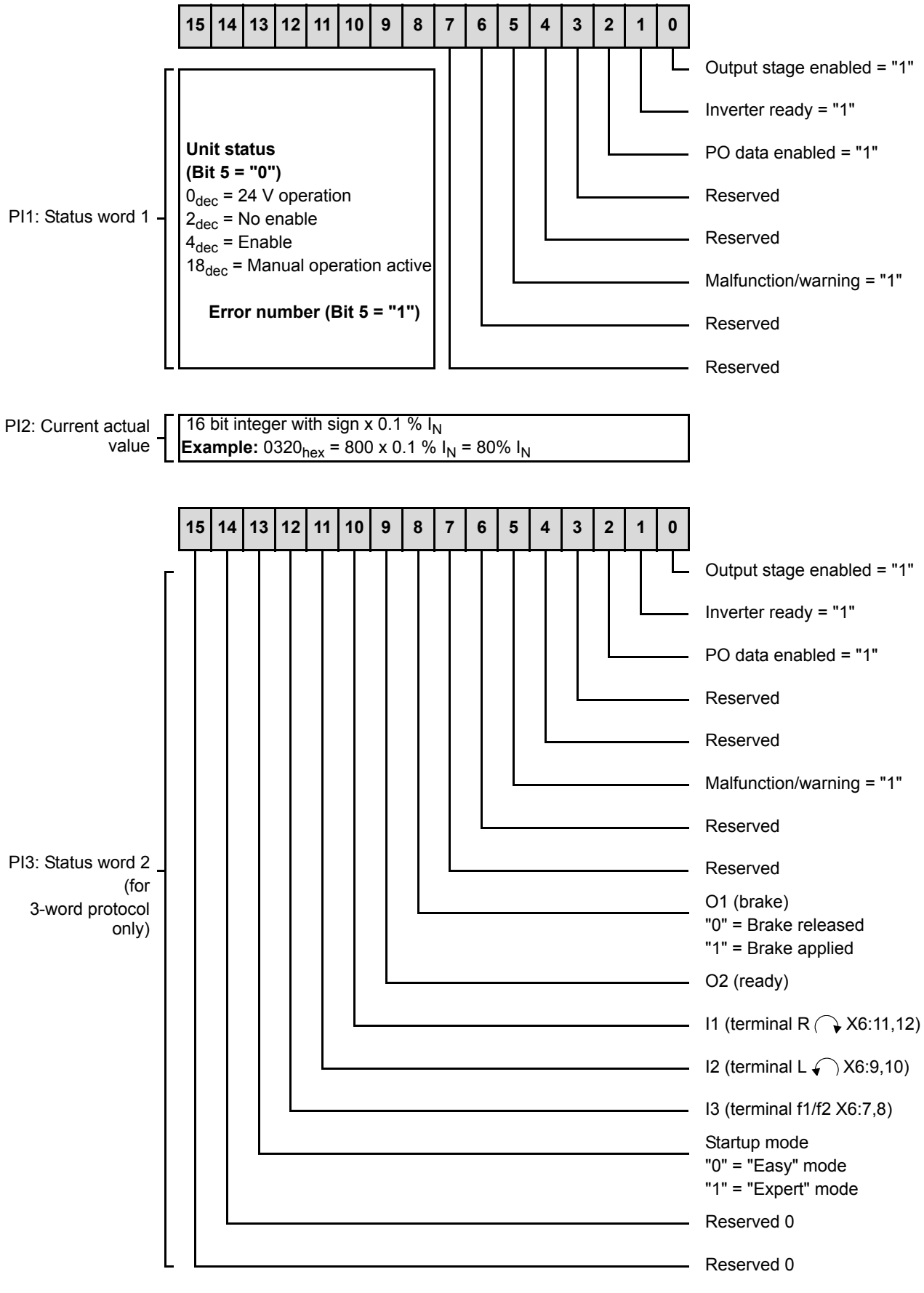
Example: 2.0 s = 2000 ms = 2000_{dec} = $07D0_{hex}$

7.4.4 Process input data

The MOVIMOT® inverter sends back process input data to the higher-level controller. The process input data consists of status and actual value information.

The MOVIMOT® inverter supports the following process input data:

- PI1: Status word 1
- PI2: Output current
- PI3: Status word 2


15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
PI1: Status word 1
Unit status
(Bit 5 = "0")
0dec = 24 V operation
2dec = No enable
4dec = Enable
18dec = Manual operation active
Error number (Bit 5 = "1")
Output stage enabled = "1"
Inverter ready = "1"
PO data enabled = "1"
Reserved
Reserved
Malfunction/warning = "1"
Reserved
Reserved
PI2: Current actual value
16 bit integer with sign x 0.1 % IN
Example: 0320hex = 800 x 0.1 % IN = 80% IN
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
PI3: Status word 2 (for 3-word protocol only)
Output stage enabled = "1"
Inverter ready = "1"
PO data enabled = "1"
Reserved
Reserved
Malfunction/warning = "1"
Reserved
Reserved
O1 (brake)
"0" = Brake released
"1" = Brake applied
O2 (ready)
I1 (terminal R X6:11,12)
I2 (terminal L X6:9,10)
I3 (terminal f1/f2 X6:7,8)
Startup mode
"0" = "Easy" mode
"1" = "Expert" mode
Reserved 0
Reserved 0

The following table shows the assignment of **status word 1**:

Bit	Meaning	Explanation
0	**Output stage enabled**	1: MOVIMOT® drive is enabled 0: MOVIMOT® drive is not enabled
1	**Inverter ready**	1: MOVIMOT® drive is ready for operation 0: MOVIMOT® drive is not ready for operation
2	**PO data enabled**	1: Process data is enabled; Drive can be controlled via fieldbus 0: Process data is inhibited; Drive cannot be controlled via fieldbus
3	Reserved	Reserved = 0
4	Reserved	Reserved = 0
5	**Error/warning**	1: Error/warning present 0: No fault/warning
6	Reserved	Reserved = 0
7	Reserved	Reserved = 0
8–15	Bit 5 = 0: **Unit status** 0_{dec}: 24 V operation 2_{dec}: No enable 4_{dec}: Enable 18_{dec}: Manual operation active Bit 5 = 1: **Error number**	If there is no fault/warning (bit 5 = 0), the operating/enable status of the inverter power section is displayed in this byte. If there is a fault/warning (bit 5 = 1), the fault number is displayed in this byte.

The following table shows the assignment of **status word 2**:

Bit	Meaning	Explanation
0	Output stage enabled	1: MOVIMOT® drive is enabled 0: MOVIMOT® drive is not enabled
1	**Inverter ready**	1: MOVIMOT® drive is ready for operation 0: MOVIMOT® drive is not ready for operation
2	**PO data enabled**	1: Process data is enabled; Drive can be controlled via fieldbus 0: Process data is inhibited; Drive cannot be controlled via fieldbus
3	Reserved	Reserved = 0
4	Reserved	Reserved = 0
5	**Error/warning**	1: Error/warning present 0: No fault/warning
6	Reserved	Reserved = 0
7	Reserved	Reserved = 0
8	**O1 brake**	1: Brake applied 0: Brake released
9	**O2 ready**	1: MOVIMOT® drive is ready for operation 0: MOVIMOT® drive is not ready for operation
10	**I1 (R X6:11,12)**	1: Binary input is set 0: Binary input is not set
11	**I2 (L X6:9,10)**	
12	**I3 (f1/f2 X6:7,8)**	
13	**Startup mode**	1: "Expert" startup mode 0: "Easy" startup mode
14	Reserved	Reserved = 0
15	Reserved	Reserved = 0

7.5 Function with RS-485 master

- The higher-level controller (e.g. PLC) is the master, the MOVIMOT® inverter is the slave.
- 1 start bit, 1 stop bit and 1 parity bit (even parity) will be used.
- Transmission complies with the SEW MOVILINK® protocol (see chapter "Coding of process data") with a fixed transfer rate of 9600 baud.

7.5.1 Message structure

⚠ WARNING

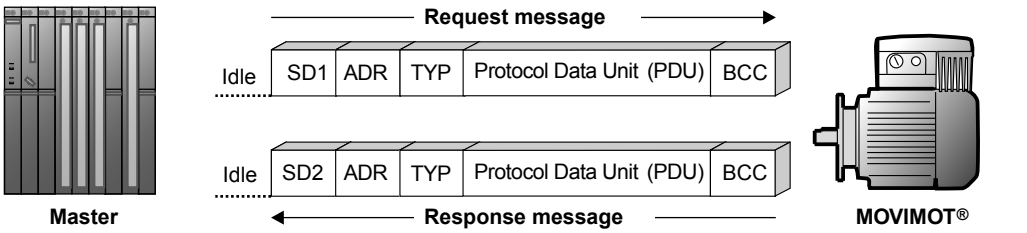
Danger of fatal injury due to uncontrolled operation.

There is no timeout monitoring when "acyclical" messages (type = "acyclical") are sent. The drive can continue to operate uncontrolled when the bus connection is interrupted.

Severe or fatal injuries.

- Run the bus connection between master and MOVIMOT® inverter only with "cyclical" transmission.

The following figure shows the message structure between the RS-485 master and the MOVIMOT® inverter:



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Idle = Idle period of at least 3.44 ms
SD1 = Start delimiter 1: Master → MOVIMOT®: 02_{hex}
SD2 = Start delimiter 2: MOVIMOT® → master: $1D_{hex}$
ADR = Address 1 – 15
Group address 101 – 115
254 = Point-to-point
255 = Broadcast
TYPE = User data type
PDU = User data
BCC = Block check character: XOR all bytes

INFORMATION

When "cyclic" messages (type = "cyclic") are sent, the MOVIMOT® inverter expects the next bus activity after a maximum wait of one second (master protocol). If this bus activity is not detected, the MOVIMOT® inverter automatically stops the drive (timeout monitoring).

7.5.2 Idle and start delimiter

The MOVIMOT® inverter detects the start of a request message by means of an idle period lasting at least 3.44 ms, followed by the character 02_{hex} (start delimiter 1). In the event that the transmission of a valid request message is canceled by the master, a new request message may not be sent until at least twice the idle period (approx. 6.88 ms) has elapsed.

7.5.3 Address (ADR)

The MOVIMOT® inverter supports the address range from 0 to 15 as well as access via the point-to-point address (254) or via the broadcast address (255).

It is only possible to read the current process input data (status word, output current) via address 0. The process output data sent by the master does not come into effect because PO data processing is not active when the address setting is 0.

7.5.4 Group address

Furthermore, ADR = 101 – 115 makes it possible to group several MOVIMOT® inverters. When this is done, all MOVIMOT® inverters in one group are set to the same RS-485 address (e.g. group 1: ADR = 1, group 2: ADR = 2).

The master can now assign new setpoints to these groups by using ADR = 101 (setpoints to inverters in group 1) and ADR = 102 (setpoints for group 2). The inverters will not send a reply in this addressing version. The master must observe a min. rest time of 25 ms between two broadcast or group messages!

7.5.5 User data type (TYP)

As a rule, the MOVIMOT® inverter supports 4 different PDU (Protocol Data Unit) types. These types are principally determined by the process data length and transmission variant.

Type	Transmission variant	Process data length	User data
03_{hex}	Cyclical	2 words	Control word / speed [%] / status word 1 / output current
83_{hex}	Acyclical	2 words	
05_{hex}	Cyclical	3 words	Control word / speed [%] / ramp / status word 1 / output current / status word 2
85_{hex}	Acyclical	3 words	

7.5.6 Timeout monitoring

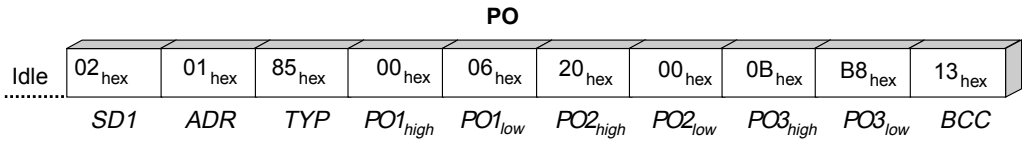
In the "cyclical" transmission variant, the MOVIMOT® inverter expects the next bus activity (request message of types named above) after a maximum of one second. If this bus activity is not detected, the drive automatically decelerates with the most recently valid ramp (timeout monitoring). The "ready signal" relay drops out. There is no timeout monitoring if the "acyclical" transmission variant is selected.

7.5.7 Block check character BCC

The block check character (BCC) is used in conjunction with even parity formation to ensure reliable data transfer. The block check character is formed by means of an XOR logic operation of all message characters. The result is entered in the BCC at the end of the message.

Example

The following figure gives an example of how a block check character is created for an acyclical message of type PDU 85_{hex} with 3 process data items. The XOR logic operation on the characters SD1 – $PO3_{low}$ results in the value 13_{hex} as the block check character BCC. This BCC will be sent as the last character of the message. The recipient checks the character parity after having received the individual characters. Following this, the block check character is created from the received characters SD1 – $PO3_{low}$ in accordance with the procedure below. The message has been correctly transmitted if the calculated and received BCCs are identical and there is no character parity error. Any other result will be displayed as a transmission error. The message may have to be repeated.



	Stop	Parity								Start	
SD1 : 02_{hex}		1	0	0	0	0	0	0	1	0	
ADR : 01_{hex}		1	0	0	0	0	0	0	0	1	XOR
TYP : 85_{hex}		1	1	0	0	0	1	0	0	1	XOR
$PO1_{high}$: 00_{hex}		0	0	0	0	0	0	0	0	0	XOR
$PO1_{low}$: 06_{hex}		0	0	0	0	0	1	0	1	0	XOR
$PO2_{high}$: 20_{hex}		1	0	0	1	0	0	0	0	0	XOR
$PO2_{low}$: 00_{hex}		0	0	0	0	0	0	0	0	0	XOR
$PO3_{high}$: $0B_{hex}$		1	0	0	0	0	0	1	1	1	XOR
$PO3_{low}$: $B8_{hex}$		0	1	0	1	1	0	1	0	0	XOR
BCC : 13_{hex}		**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	

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7.5.8 Message processing in the MOVILINK® master

The following algorithm must be observed for sending and receiving MOVILINK® messages in any programmable controllers, in order to ensure correct data transmission.

a) Sending a request message

E.g. sending setpoints to the MOVIMOT® inverter

1. Wait for expiration of idle period (at least 3.44 ms, at least 25 ms with group or broadcast messages).
2. Send request message to inverter.

b) Receive response message

(Acknowledgement signal + actual values from MOVIMOT® inverter)

1. The response message must be received within approx. 100 ms, otherwise, for example, it is sent again.
2. Calculated block check character (BCC) of the response message = received BCC?
3. Start delimiter of response message = $1D_{hex}$?
4. Response address = Request address?
5. Response PDU type = Request PDU type?
6. All criteria satisfied: => transfer OK! Process data valid.
7. The next request message can now be sent (continue from point a).

All criteria satisfied: => transfer OK! Process data valid. The next request message can now be sent (continue from point a).

7.5.9 Sample message

This example shows the control of a MOVIMOT® drive via three process data words of PDU type 85_{hex} (3 PD acyclical). The RS-485 master sends three process output data words (PO) to the MOVIMOT® inverter. The MOVIMOT® inverter replies by sending three process input data words (PI).

Request message from the RS-485 master to MOVIMOT®

PO1: 0006_{hex} Control word 1 = Enable
PO2: 2000_{hex} Speed [%] setpoint = 50 % (of f_{max} [1])
PO3: $0BB8_{hex}$ Ramp = 3 s

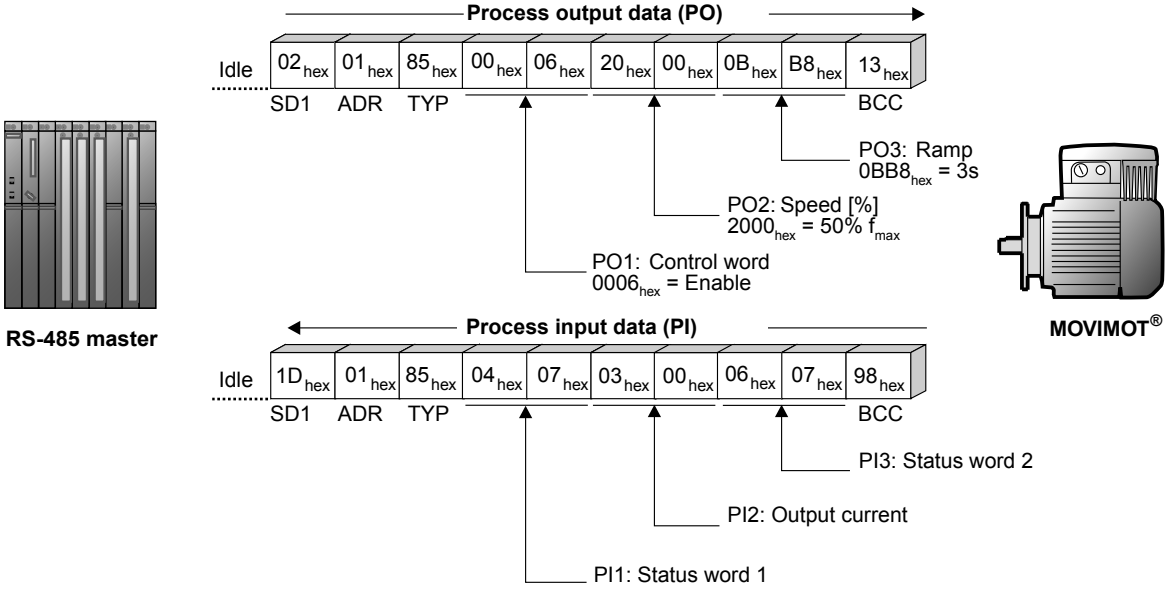
1) f_{max} is set via setpoint potentiometer f1

Response message from MOVIMOT® to RS-485 master

PI1: 0406_{hex} Status word 1
PI2: 0300_{hex} Output current [% I_N]
PI3: 0607_{hex} Status word 2

For more information on the coding of the process data, refer to sec. "Coding process data" (page 106).

Sample message "3 PD acyclical"



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This example shows the acyclical transmission variant. The timeout monitoring in the MOVIMOT® inverter is deactivated. The cyclical transmission variant can be implemented with the entry TYPE = 05_{hex}. In this case, the MOVIMOT® inverter expects the next bus activity (request message of types named above) after a no more than one second. Otherwise, the MOVIMOT® inverter automatically stops the drive (timeout monitoring).

8 "Expert" Startup with Parameter Function

	INFORMATION
	"Expert" startup is only necessary if parameters are to be set during startup. "Expert" startup is only possible if: • No additional function is activated (DIP switch S2/5 - S2/8 = "OFF"), • The Drive ID module is plugged in, • And parameter *P805 Startup mode* is set to "Expert mode".

8.1 Important notes on startup

INFORMATION

You must comply with the general safety notes in chapter "Safety Notes" during startup.

⚠ WARNING

Risk of crushing due to missing or defective protective covers.

Severe or fatal injuries.

- Install the protective covers of the plant according to the instructions, also see the operating instructions of the gear unit.
- Never start up the MOVIMOT® drive if the protective covers are not installed.

⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.

Severe or fatal injuries.

- De-energize the MOVIMOT® drive using a suitable cut-off device before removing the MOVIMOT® inverter.
- Secure the drive against unintended re-connection to the voltage supply.
- Wait for at least 1 minute before removing the MOVIMOT® inverter.

⚠ WARNING

Danger of burns due to hot surfaces of the MOVIMOT® drive (especially the heat sink) or external options.

Severe injuries.

- Do not touch the MOVIMOT® drive and external options until they have cooled down sufficiently.

⚠ WARNING

Unit malfunction due to incorrect unit setting.

Severe or fatal injuries.

- Observe the startup instructions.
- The installation must only be carried out by qualified personnel.
- Check the parameters and data sets.
- Only use settings that are consistent with the function.

INFORMATION

To ensure fault-free operation, do not disconnect or connect power or signal cables during operation.

INFORMATION

- Remove paint protection cap from the status LED before startup.
- Remove paint protection film from the nameplates before startup.
- Observe a minimum switch-off time of 2 s for the line contactor K11.

8.2 Requirements

The following conditions apply to startup:

- The MOVIMOT® drive must be installed correctly both mechanically and electrically.
- Appropriate safety measures prevent the drives from starting up unintentionally.
- Appropriate safety measures must be taken to prevent risk of injury or damage to machine.

The following hardware is required for startup:

- PC or laptop, see chapter "PC connection" (page 55)

The following software is required on the PC or laptop:

- MOVITOOLS® MotionStudio

8.3 MOVITOOLS® MotionStudio

The "MOVITOOLS® MotionStudio" software package is the SEW engineering tool that you can use to access all SEW drive units. In case of simple applications, you can use MOVITOOLS® MotionStudio to diagnose the MOVIMOT® inverter. For more sophisticated applications, you can startup and parameterize the MOVIMOT® inverter with the help of a wizard. The scope function in MOVITOOLS® MotionStudio can be used for visualizing process values.

Install the latest software version of MOVITOOLS® MotionStudio on your PC.

MOVITOOLS® MotionStudio can communicate with the drive units using different communication links and fieldbus systems.

The following chapters describe the most straightforward application, a connection between a PC / laptop and a MOVIMOT® inverter via the diagnostics interface X50 (point-to-point connection).

8.3.1 Integrating MOVIMOT® in MOVITOOLS® MotionStudio

INFORMATION

For a detailed description of the following steps, please refer to the comprehensive online help in MOVITOOLS® MotionStudio.

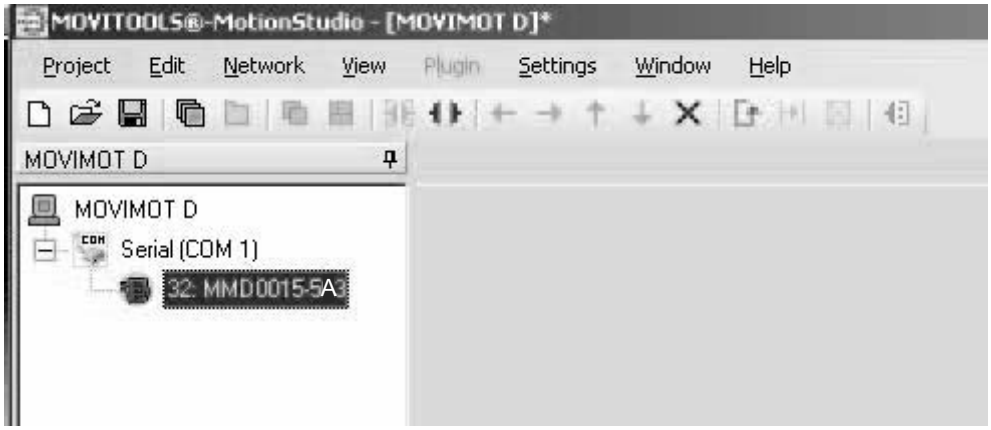
1. Start MOVITOOLS® MotionStudio.
2. Create a project and network.
3. Configure the communication channel at the PC.
4. Make sure that the 24 V supply of the MOVIMOT® inverter is connected.
5. Perform an online scan.

   Check the set scanning range in MOVITOOLS® MotionStudio.

INFORMATION

- The diagnostic interface is always assigned **address 32**.
  Adjust the scan range in MOVITOOLS® MotionStudio in such a way that address 32 is also scanned.
- The baud rate is 9.6 kBd.
- The online scan can take some time.

6. MOVIMOT®, for example, is displayed in MOVITOOLS® MotionStudio as follows:



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7. Right-click on "32: MMD0015-5A3" to have access to MOVIMOT® startup and diagnostics tools in the context menu.

8.4 Startup and function expansion with individual parameters

The basic functionality of the MOVIMOT® drive can be expanded by using individual parameters.

INFORMATION

This "Expert" startup is only possible if:

- No additional function is activated (DIP switch S2/5 - S2/8 = "OFF"),
- The Drive ID module is plugged in
- And parameter *P805 Startup mode* is set to "Expert mode".

Proceed as follows:

1. It is essential to observe the safety and warning instructions of chapter "Important notes on startup" (page 116) when working on the MOVIMOT® inverter.
2. Perform "Easy" startup according to chapter 6.
3. Connect the PC or the DBG keypad to the MOVIMOT® inverter.

   See chapter "PC connection" (page 55) or chapter "DBG keypad connection" (page 54).
4. Connect the 24 V supply of the MOVIMOT® inverter.
5. When using a PC, start MOVITOOLS® MotionStudio and integrate the MOVIMOT® inverter.

   See chapter "Integrating MOVIMOT® in MOVITOOLS® MotionStudio". (page 118)
6. Set parameter *P805 Startup mode* to "Expert".
7. Determine the parameters that you want to change.
8. Check whether these parameters depend on mechanical controls.

   See sec. "Parameters that depend on mechanical controls". (page 149)
9. Deactivate the respective controls by adjusting the bit-coded selection box of parameter *P102*.

   See chapter "Parameter 102" (page 136).
10. Change the selected parameters.

    For information on parameter setting with the DBG keypad, refer to chapter "Parameter mode" (page 167).
11. Test the functionality of the MOVIMOT ® drive.

    Optimize the parameters, if required.
12. Disconnect the PC or the DBG keypad from the MOVIMOT® inverter.
13. Make sure the screw plug of the diagnostics interface X50 has a seal and screw it in.

    NOTICE Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

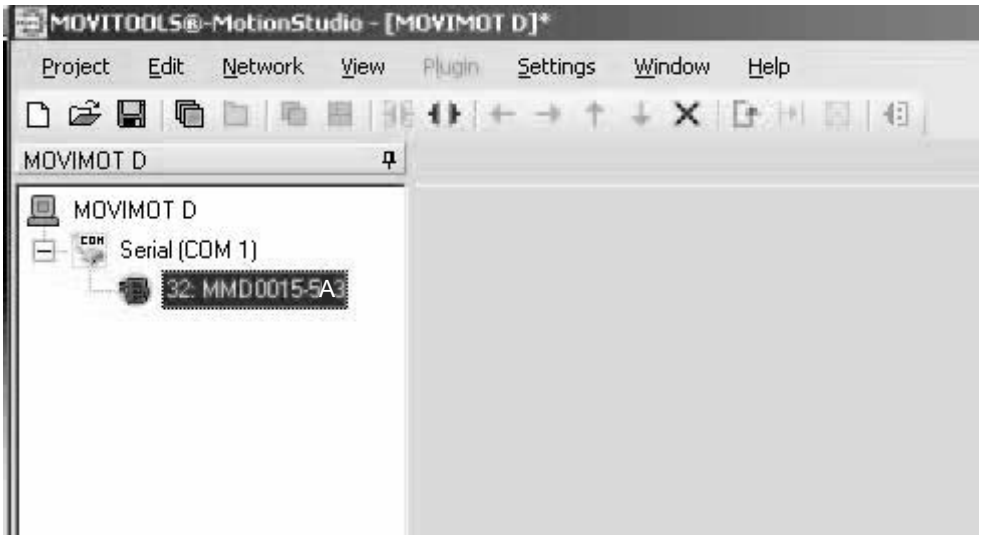
    Damage to the MOVIMOT® inverter.

    - Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

8.4.1 Example

Fine adjustment of setpoint f2 using MOVITOOLS® MotionStudio

1. It is essential to observe the safety and warning instructions of chapter "Important notes on startup" when working on the MOVIMOT® inverter.
2. Perform "Easy" startup using switch f2 for rough adjustment, e.g. setting 5 (25 Hz = 750 rpm).
3. Connect the PC to the MOVIMOT® inverter.
4. Connect the 24 V supply of the MOVIMOT® inverter.
5. Start MOVITOOLS® MotionStudio.
6. Create a project and network.
7. Configure the communication channel at the PC.
8. Perform an online scan.



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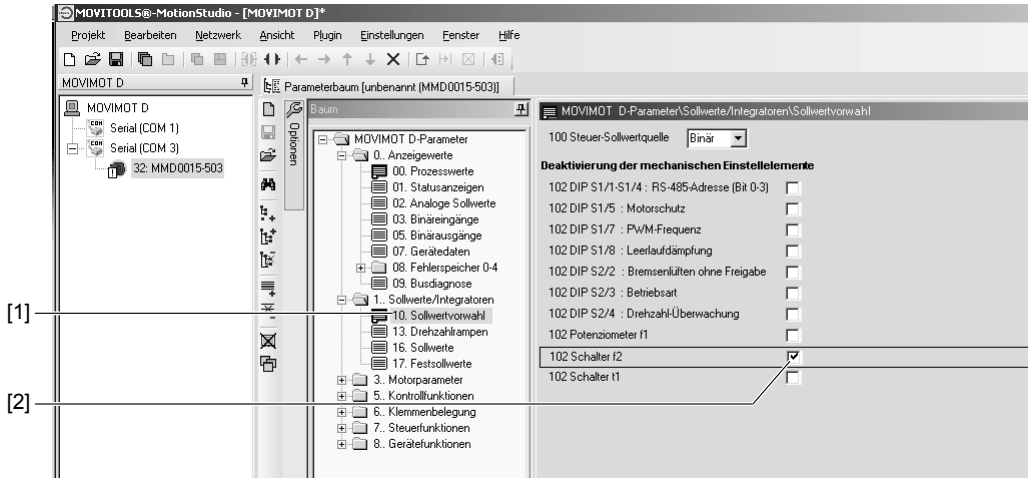
9. Open the context menu by clicking the right mouse button and select the menu item "Startup" / "Parameter tree".

10. Set parameter *P805 Startup mode* to "Expert".



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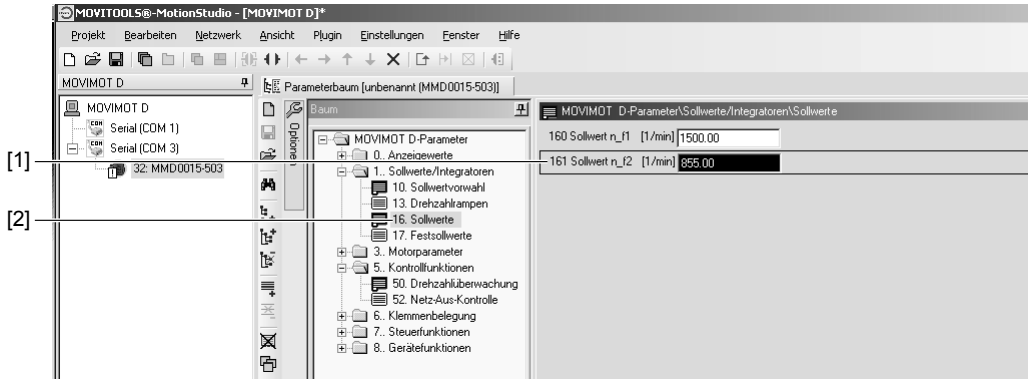
11. Open the folder "Setpoint selection" [1].

    Deactivate switch f2 [2] by setting the check box of parameter *P102 Deactivating mechanical controls* [2] (parameter *P102:14* = "**1**" => *P102* = "0**1**00 0000 0000 0000").



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12. Open the folder "Setpoints" [2].

    Adjust parameter *P161 Setpoint n_f2* [1] until the application is working optimally.

    E.g. parameter *P161* = 855 rpm (= 28.5 Hz)

13. Disconnect the PC from the MOVIMOT® inverter.

14. Make sure the screw plug of the diagnostics interface X50 has a seal and screw it in.

    NOTICE Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

    Damage to the MOVIMOT® inverter.

    - Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

8.5 Startup and configuration with a central controller and MQP..

You can use a central controller to startup and configure the MOVIMOT® drive via the fieldbus interface MQP.. (PROFIBUS-DPV1).

INFORMATION

This "Expert" startup is only possible if:

- No additional function is activated (DIP switch S2/5 - S2/8 = "OFF"),
- The Drive ID module is plugged in
- And parameter *P805 Startup mode* is set to "Expert mode".

Proceed as follows:

1. It is essential to observe the safety and warning instructions of chapter "Important notes on startup" when working on the MOVIMOT® inverter.
2. Check the connection of the MOVIMOT® inverter.

   See chapter "Electrical Installation".
3. Connect the 24 V supply of the MOVIMOT® inverter.
4. Establish communication between the higher-level controller and the MOVIMOT® inverter.

   Connection and communication with the higher-level controller depend on the type of the higher-level controller.

   For information about connecting the higher-level controller to the MOVIMOT® inverter, refer to the "PROFIBUS Interfaces, Field Distributors" manual.
5. Set parameter *P805 Startup mode* to "Expert".
6. Deactivate all mechanical controls by overwriting the bit-coded selection box of parameter *P102* with "FFFFhex" (*P102* = "1111 1111 1111 1111").
7. Set the control setpoint source to RS-485 by setting the parameter *P100 Control setpoint source* to "1".
8. Set the required parameters.
9. Test the functionality of the MOVIMOT ® drive.

   Optimize the parameters, if required.

8.6 Startup by transferring the set of parameters

You can startup several MOVIMOT® drives with the same parameter set.

Parameters can only be transferred between two identical MOVIMOT® drives (same inverter and same motor).

INFORMATION

The parameter set can only be transferred if:

- No additional function is activated (DIP switch S2/5 - S2/8 = "OFF"),
- The Drive ID module is plugged in
- And a parameter set from one MOVIMOT® reference unit already exists.

8.6.1 Transferring the parameter set using MOVITOOLS® of the DBG keypad

1. It is essential to observe the safety and warning instructions of chapter "Important notes on startup" (page 116) when working on the MOVIMOT® inverter.
2. Check the connection of the MOVIMOT® inverter.

   See chapter "Electrical Installation".
3. Set all controls identical with those of the reference unit.
4. Connect the PC or the DBG keypad to the MOVIMOT® inverter.

   See chapter "PC connection" (page 55) or chapter "DBG keypad connection" (page 54).
5. Connect the 24 V supply of the MOVIMOT® inverter.
6. When using a PC, start MOVITOOLS® MotionStudio and integrate the MOVIMOT® inverter into MOVITOOLS®.

   See chapter "Integrating MOVIMOT® in MOVITOOLS® MotionStudio" (page 118).
7. Transfer the entire parameter set of the MOVIMOT® reference unit to the MOVIMOT® inverter.

   For information on transferring the parameter set with the DBG keypad, refer to chapter "Copying function of the DBG keypad" (page 171).
8. Test the functionality of the MOVIMOT ® drive.
9. Disconnect the PC or the DBG keypad from the MOVIMOT® inverter.
10. Make sure the screw plug of the diagnostics interface X50 has a seal and screw it in.

    NOTICE Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

    Damage to the MOVIMOT® inverter.

    - Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

8.6.2 Transferring parameters using a central controller and MQP..

Parameters can only be transferred between two identical MOVIMOT® drives (same inverter and same motor).

1. It is essential to observe the safety and warning instructions of chapter "Important notes on startup" when working on the MOVIMOT® inverter.
2. Check the connection of the MOVIMOT® inverter.

   See chapter "Electrical Installation".
3. Set all controls identical with those of the reference unit.
4. Connect the 24 V supply of the MOVIMOT® inverter.
5. Establish communication between the higher-level controller and the MOVIMOT® inverter.

   Connection and communication with the higher-level controller depend on the type of the higher-level controller.

   For information about connecting the higher-level controller to the MOVIMOT® inverter, refer to the "PROFIBUS Interfaces, Field Distributors" manual.
6. Transfer all parameters of the MOVIMOT® reference unit to the MOVIMOT® inverter.

INFORMATION

Parameter *P805 Startup mode* must be the first value to be transferred.

   The transfer procedure depends on the type of higher-level controller.
7. Test the functionality of the MOVIMOT ® drive.

8.7 Parameter list

No.	Index dec.	Subindex dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	MOVILINK® scaling
0__	**Display values**				
00_	**Process values**				
000	8318	0	Speed (signed)	[rpm]	1 digit = 0.001 rpm
002	8319	0	Frequency (signed)	[Hz]	1 digit = 0.001 Hz
004	8321	0	Output current (value)	[% I_N]	1 digit = 0.001 % I_N
005	8322	0	Active current (signed)	[% I_N]	1 digit = 0.001 % I_N
006	8323	0	Motor utilization	[%]	1 digit = 0.001 %
008	8325	0	DC link voltage	[V]	1 digit = 0.001 V
009	8326	0	Output current	[A]	1 digit = 0.001 A
01_	**Status displays**				
010	8310	0	Inverter state	[Text]	
011	8310	0	Operating status	[Text]	
012	8310	0	Error status	[Text]	
013	10095	1	Startup mode	[Text]	
014	8327	0	Heat sink temperature	[°C]	1 digit = 1 °C
015	8328	0	Operating hours	[h]	1 digit = 1 min = 1/60 h
016	8329	0	Enable hours	[h]	1 digit = 1 min = 1/60 h
017	10087	135	DIP switch setting S1, S2	[Bit field]	
018	10096	27	Setting switch f2	0,1,2, – 10	
019	10096	29	Setting switch t1	0,1,2, – 10	
02_	**Analog setpoints**				
020	10096	28	Setting of setpoint potentiometer f1	0 – 10	1 digit = 0.001
03_	**Binary inputs**				
031	8334 Bit 1	0	Setting binary input X6: 11,12	[Bit field]	
	8335	0	Assignment binary input X6: 11,12	CW/stop (factory setting)	
032	8334 Bit 2	0	Setting binary input X6: 9,10	[Bit field]	
	8336	0	Assignment binary input X6: 9,10	CCW/stop (factory setting)	
033	8334 Bit 3	0	Setting binary input X6: 7,8	[Bit field]	
	8337	0	Assignment binary input X6: 7,8	Setpoint changeover (factory setting)	
05_	**Binary outputs**				
050	8349 Bit 0	0	Setting signal relay K1	[Bit field]	
	8350	0	Assignment signal relay K1	Ready for operation (factory setting)	
051	8349 Bit 1	0	Setting output X10	[Bit field]	
	8351	0	Assignment output X10	Brake released	

No.	Index dec.	Subindex dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	MOVILINK® scaling
07_	**Unit data**				
070	8301	0	Unit type	[Text]	
071	8361	0	Nominal output current	[A]	1 digit = 0.001 A
072	8930	0	DIM slot option	[Text]	
076	8300	0	Basic unit firmware	[Part number and version]	
100	10096	33	Control setpoint source	(Display value)	
102	10096	30	Deactivating mechanical control elements	(Display value)	
700	8574	0	Operating mode	[Text]	
08_	**Error memory**				
080	Error t-0		Background information for errors that occurred in the past when t-0		
	8366	0	Error code	Error code	
	9304	0	Fault subcode		
	8883	0	Internal error		
	8371	0	Status of binary inputs	[Bit field bit 0, bit 1, bit 2]	
	8381	0	Status of binary outputs K1, X10	[Bit field bit 0, bit 1]	
	8391	0	Inverter state	[Text]	
	8396	0	Heat sink temperature	[°C]	1 digit = 1 °C
	8401	0	Speed	[rpm]	1 digit = 0.001 rpm
	8406	0	Output current	[% I_N]	1 digit = 0.001 % I_N
	8411	0	Active current	[% I_N]	1 digit = 0.001 % I_N
	8416	0	Unit utilization	[% I_N]	1 digit = 0.001 % I_N
	8421	0	DC link voltage	[V]	1 digit = 0.001 V
	8426	0	Operating hours	[h]	1 digit = 1 min = 1/60 h
	8431	0	Enable hours	[h]	1 digit = 1 min = 1/60 h
081	Error t-1		Background information for errors that occurred in the past when t-1		
	8367	0	Error code	Error code	
	9305	0	Fault subcode		
	8884	0	Internal error		
	8372	0	Status of binary inputs	[Bit field bit 0, bit 1, bit 2]	
	8382	0	Status of binary outputs K1, X10	[Bit field bit 0, bit 1]	
	8392	0	Inverter state	[Text]	
	8397	0	Heat sink temperature	[°C]	1 digit = 1 °C
	8402	0	Speed	[rpm]	1 digit = 0.001 rpm
	8407	0	Output current	[% I_N]	1 digit = 0.001 % I_N
	8412	0	Active current	[% I_N]	1 digit = 0.001 % I_N
	8417	0	Unit utilization	[%]	1 digit = 0.001 % I_N
	8422	0	DC link voltage	[V]	1 digit = 0.001 V
	8427	0	Operating hours	[h]	1 digit = 1 min = 1/60 h
	8432	0	Enable hours	[h]	1 digit = 1 min = 1/60 h

No.	Index dec.	Subindex dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	MOVILINK® scaling
082	Error t-2		Background information for errors that occurred in the past when t-2		
	8368	0	Error code	Error code	
	9306	0	Fault subcode		
	8885	0	Internal error		
	8373	0	Status of binary inputs	[Bit field bit 0, bit 1, bit 2]	
	8383	0	Status of binary outputs K1, X10	[Bit field bit 0, bit 1]	
	8393	0	Inverter state	[Text]	
	8398	0	Heat sink temperature	[°C]	1 digit = 1 °C
	8403	0	Speed	[rpm]	1 digit = 0.001 rpm
	8408	0	Output current	[% I_N]	1 digit = 0.001 % I_N
	8413	0	Active current	[% I_N]	1 digit = 0.001 % I_N
	8418	0	Unit utilization	[%]	1 digit = 0.001 % I_N
	8423	0	DC link voltage	[V]	1 digit = 0.001 V
	8428	0	Operating hours	[h]	1 digit = 1 min = 1/60 h
	8433	0	Enable hours	[h]	1 digit = 1 min = 1/60 h
083	Error t-3		Background information for errors that occurred in the past when t-3		
	8369	0	Error code	Error code	
	9307	0	Fault subcode		
	8886	0	Internal error		
	8374	0	Status of binary inputs	[Bit field bit 0, bit 1, bit 2]	
	8384	0	Status of binary outputs K1, X10	[Bit field bit 0, bit 1]	
	8394	0	Inverter state	[Text]	
	8399	0	Heat sink temperature	[°C]	1 digit = 1 °C
	8404	0	Speed	[rpm]	1 digit = 0.001 rpm
	8409	0	Output current	[% I_N]	1 digit = 0.001 % I_N
	8414	0	Active current	[% I_N]	1 digit = 0.001 % I_N
	8419	0	Unit utilization	[%]	1 digit = 0.001 % I_N
	8424	0	DC link voltage	[V]	1 digit = 0.001 V
	8429	0	Operating hours	[h]	1 digit = 1 min = 1/60 h
	8434	0	Enable hours	[h]	1 digit = 1 min = 1/60 h
084	Error t-4		Background information for errors that occurred in the past when t-4		
	8370	0	Error code	Error code	
	9308	0	Fault subcode		
	8887	0	Internal error		
	8375	0	Status of binary inputs	[Bit field bit 0, bit 1, bit 2]	
	8385	0	Status of binary outputs K1, X10	[Bit field bit 0, bit 1]	
	8395	0	Inverter state		
	8400	0	Heat sink temperature	[°C]	1 digit = 1 °C
	8405	0	Speed	[rpm]	1 digit = 0.001 rpm
	8410	0	Output current	[% I_N]	1 digit = 0.001 % I_N
	8415	0	Active current	[% I_N]	1 digit = 0.001 % I_N
	8420	0	Unit utilization	[%]	1 digit = 0.001 % I_N
	8425	0	DC link voltage	[V]	1 digit = 0.001 V
	8430	0	Operating hours	[h]	1 digit = 1 min = 1/60 h
	8435	0	Enable hours	[h]	1 digit = 1 min = 1/60 h

No.	Index dec.	Subindex dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	MOVILINK® scaling
09_	**Bus diagnostics**				
094	8455	0	PO 1 setpoint	[hex]	
095	8456	0	PO 2 setpoint	[hex]	
096	8457	0	PO 3 setpoint	[hex]	
097	8458	0	PI 1 actual value	[hex]	
098	8459	0	PI 2 actual value	[hex]	
099	8460	0	PI 3 actual value	[hex]	
1__	**Setpoints/ramp generators**				
10_	**Setpoint selection**				
100	10096	33	Control setpoint source	0: Binary 1: RS-485 (DIP switch S1/1-4)[1)]	
102	10096	30	Deactivating mechanical control elements	[Bit field] Default: **0000 0000 0000 0000**	
13_	**Speed ramps**				
130	8807	0	Ramp t11 up	0.1 – **1** – 2000 [s] (Switch t1)[1)]	1 digit = 0.001 s
131	8808	0	Ramp t11 down	0.1 – **1** – 2000 [s] (Switch t1)[1)]	1 digit = 0.001 s
134	8474	0	Ramp t12 up = down	0.1 – **10** – 2000 [s]	1 digit = 0.001 s
135	8475	0	S pattern t12	**0: OFF** 1: Level 1 2: Level 2 3: Level 3	
136	8476	0	Stop ramp t13	0.1 – **0.2** – 2000 [s]	1 digit = 0.001 s
16_	**Setpoints**				
160	10096	35	Setpoint n_f1	0 – **1500** – 3600 rpm	1 digit = 0.001 rpm
161	10096	36	Setpoint n_f2	0 – **150 –** 3600 rpm	1 digit = 0.001 rpm
17_	**Fixed setpoints**				
170	8489	0	Fixed setpoint n0	-3600 – **150** – 3600 rpm	1 digit = 0.001 rpm
171	8490	0	Fixed setpoint n1	-3600 – **750** – 3600 rpm	1 digit = 0.001 rpm
172	8491	0	Fixed setpoint n2	-3600 – **1500** – 3600 rpm	1 digit = 0.001 rpm
173	10096	31	Fixed setpoint n3	-3600 – **2500** – 3600 rpm	1 digit = 0.001 rpm
3__	**Motor parameters**				
30_	**Limits**				
300	8515	0	Start/stop speed	0 – **15** – 150 rpm	1 digit = 0.001 rpm
301	8516	0	Minimum speed	0 – **60** – 3600 rpm	1 digit = 0.001 rpm
302	8517	0	Maximum speed	0 – **3000** – 3600 rpm	1 digit = 0.001 rpm
303	8518	0	Current limit	0 – **160** [% I_N]	1 digit = 0.001 % I_N
32_	**Motor adjustment**				
320	8523	0	Automatic adjustment	0: OFF **1: ON**	
321	8524	0	Boost	0 – 100 [%]	1 digit = 0.001 %
322	8525	0	IxR adjustment	0 – 100 [%]	1 digit = 0.001 %
323	8526	0	Premagnetization	0 – 2 [s]	1 digit = 0.001 s
324	8527	0	Slip compensation	0 – 500 [rpm]	1 digit = 0.001 rpm
325	8834	0	No-load vibration damping	0: OFF 1: ON (DIP switch S1/8)[1)]	

No.	Index dec.	Subindex dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	MOVILINK® scaling
34_	**Motor protection**				
340	8533	0	Motor protection	0: OFF 1: ON (DIP switch S1/5)[1)]	
341	8534	0	Type of cooling	**0: Fan cooled** 1: Forced cooling	
347	10096	32	Motor cable length	**0** – 15 [m]	1 digit = 1 m
5__	**Monitoring functions**				
50_	**Speed monitoring**				
500	8557	0	Speed monitoring	0: OFF 3: Motor/regenerative (DIP switch S2/4)[1)]	
501	8558	0	Delay time	0.1 – **1** – 10 [s]	1 digit = 0.001 s
52_	**Mains OFF monitoring**				
522	8927	0	Mains phase failure monitoring **Deactivating the mains phase failure check in unfavorable operating conditions can damage the unit.**	0: OFF **1: ON**	
523	10096	26	Mains off monitoring	**0: Operation on three-phase mains supply** 1: Operation with MOVITRANS®	
6__	**Terminal assignment**				
60_	**Binary inputs**				
600	10096	34	Terminal configuration	**0: Setpoint changeover CCW / Stop - CW / Stop** 1: Fixed setpoint 2 - Fixed setpoint 1- Enable / Stop 2: Setpoint changeover - /Ext. error - Enable/stop	
62_	**Binary outputs**				
620	8350	0	Signal output K1	0: No function **2: Ready** 3: Output stage on 4: Rotating field on 5: Brake released 6: Brake applied	
7__	**Control functions**				
70_	**Operating modes**				
700	8574	0	Operating mode	**0: VFC** 2: VFC hoist 3: VFC DC braking 21: V/f characteristic curve 22: V/f + DC braking (DIP switch S2/3)[1)]	
71_	**Standstill current**				
710	8576	0	Standstill current	**0** – 50% I_{Mot}	1 digit = 0.001 % I_{Mot}
72_	**Setpoint stop function**				
720	8578	0	Setpoint stop function	**0: OFF** 1: ON	
721	8579	0	Stop setpoint	0 – **30** – 500 rpm	1 digit = 0.001 rpm
722	8580	0	Start offset	0 – **30** – 500 rpm	1 digit = 0.001 rpm
73_	**Brake function**				
731	8749	0	Brake release time	**0** – 2 [s]	1 digit = 0.001 s
732	8585	0	Brake application time	0 – **0.2** – 2 [s]	1 digit = 0.001 s
738	8893	0	Activation of brake release without drive enable	0: OFF 1: ON (DIP switch S2/2)[1)]	
77_	**Energy-saving function**				

No.	Index dec.	Subindex dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	MOVILINK® scaling
770	8925	0	Energy-saving function	**0: OFF** 1: ON	
8__	**Unit functions**				
80_	**Setup**				
802	8594	0	Factory setting	**0: No factory setting** 2: Delivery state	
803	8595	0	Parameter lock	**0: OFF** 1: ON	
805	10095	1	Startup mode	**0: Easy** 1: Expert	
81_	**Serial communication**				
810	8597	0	RS-485 address	0 – 31 (DIP switch S1/1-4) [1]	
811	8598	0	RS485 group address	100 – 131 (DIP switch S1/1-4)[1]	
812	8599	0	RS-485 timeout interval	0 – **1** – 650 [s]	1 digit = 0.001 s
83_	**Error responses**				
830	8609	0	External fault	0: No response 1: Display error 2: Immediate stop/error 4: Rapid stop/error 5: Immediate stop/warning 7: Rapid stop/warning 11: Normal stop/warning **12: Normal stop/error**	
832	8611	0	Motor overload error	0: No response 1: Display error 2: Immediate stop/error **4: Rapid stop/error** 12: Normal stop/error	
84_	**Reset behavior**				
840	8617	0	Manual reset	**0: No** 1: Yes	
86_	**Modulation**				
860	8620	0	PWM frequency	**0: 4 kHz** 1: 8 kHz 3: 16 kHz (DIP switch S1/7) [1]	
87_	**Process data assignment**				
870	8304	0	Setpoint description PO 1	Control word (display only)	
871	8305	0	Setpoint description PO 2	1: Setpoint speed **11: Setpoint speed [%]**	
872	8306	0	Setpoint description PO 3	Ramp (display only)	
873	8307	0	Actual value description PI 1	Status word 1 (display only)	
874	8308	0	Actual value description PI 2	1: Actual speed **2: Output current** 3: Active current 8: Actual speed [%]	
875	8309	0	Actual value description PI 3	Status word 2 (display only)	
876	8622	0	PO data enable	0: YES 1: NO	

1) When the control element (e.g. switch) is deactivated via parameter P102, the initialization value of the parameter equals the value that was set most recently.

8.8 Parameter description

8.8.1 Display values

Parameter 000 **Speed (signed)**

The displayed speed is the calculated actual speed.

Parameter 002 **Frequency (signed)**

Output frequency of the inverter

Parameter 004 **Output current (value)**

Apparent current in the range 0 – 200% of the nominal unit current

Parameter 005 **Active current (signed)**

Active current in range -200% – +200% of the nominal unit current

The sign of the active current depends on the direction of rotation and the type of load:

Dir. of rotation	Load	Speed	Active current
Clockwise rotation	motor	Positive (n > 0)	Positive (I_W > 0)
Counterclockwise rotation	motor	Negative (n < 0)	Negative (I_W < 0)
Clockwise rotation	regenerative	Positive (n > 0)	Negative (I_W < 0)
Counterclockwise rotation	regenerative	Negative (n < 0)	Positive (I_W > 0)

Parameter 006 **Motor utilization**

Motor utilization in [%], calculated using a motor temperature model

Parameter 008 **DC link voltage**

Voltage in [V] measure in the DC link

Parameter 009 **Output current**

Apparent current in [A]

Parameter 010 **Inverter state**

Inverter statuses

- INHIBITED
- ENABLED

Parameter 011 **Operating status**

The following operating states are possible:

- 24 V OPERATION
- CONTROLLER INHIBIT
- NO ENABLE
- STANDSTILL CURRENT
- ENABLE
- FACTORY SETTING
- ERROR
- TIMEOUT

Parameter 012 **Error status**

Error status in text form

Parameter 013 **Startup mode**

"Easy" or "Expert" startup mode

Parameter 014 **Heat sink temperature**

Heat sink temperature of the inverter

Parameter 015 **Operating hours**

The total of hours in which the inverter was connected to the external DC 24 V supply

Parameter 016 **Enable hours**

Sum of hours in which the output stage of the inverter was enabled

Parameter 017 **Setting of DIP switches S1 and S2**

Display of DIP switch settings for S1 and S2:

DIP switch	Bit in index 10087.135	Functionality	
S1/1	Bit 0	Unit address	Unit address bit 2^0
S1/2	Bit 1		Unit address bit 2^1
S1/3	Bit 2		Unit address bit 2^2
S1/4	Bit 3		Unit address bit 2^3
S1/5	Bit 11	Motor protection	0: Motor protection ON 1: Motor protection OFF
S1/6	Bit 9	Increased short-time torque	0: Motor adjusted 1: Motor power rating one stage smaller
S1/7	Bit 12	PWM cycle frequency	0: 4 kHz 1: Variable (16, 8, 4 kHz)
S1/8	Bit 13	No-load damping	0: Off 1: On
S2/1	Bit 7	Brake type	0: Standard brake 1: Optional brake
S2/2	Bit 15	Brake release without drive enable	0: Off 1: On
S2/3	Bit 6	Control modes	0: VFC control 1: V/f control
S2/4	Bit 16	Speed monitoring	0: Off 1: On
S2/5	Bit 17	Additional function	Additional function setting bit 2^0
S2/6	Bit 18		Additional function setting bit 2^1
S2/7	Bit 19		Additional function setting bit 2^2
S2/8	Bit 20		Additional function setting bit 2^3

Display of the DIP switch setting is independent of whether the DIP switch function is activated or deactivated.

Parameter 018 **Setting switch f2**

Displays the setting of switch f2

Display of the DIP switch setting is independent of whether the DIP switch function is activated or deactivated.

Parameter 019 **Setting switch t1**

Displays the setting of switch t1

Display of the DIP switch setting is independent of whether the DIP switch function is activated or deactivated.

Parameter 020 **Setting of setpoint potentiometer f1**

Displays the setting of setpoint potentiometer f1

Display of the DIP switch setting is independent of whether the DIP switch function is activated or deactivated.

Parameter 031 **Setting/assignment of binary input, terminal X6:11,12**

Displays the status of the binary input at terminal R ↷ X6:11,12

Parameter 032 **Setting/assignment of binary input, terminal X6:9,10**

Displays the status of the binary input at terminal L ↶ X6:9,10

Parameter 033 **Setting/assignment of binary input, terminal X6:7,8**

Displays the status of the binary input at terminal f1/f2 X6:7,8

Parameter 050 **Setting / assignment signal relay K1**

Displays the status of the signal relay K1

Parameter 051 **Setting output X10**

Displays the status of the output for controlling the BEM option

Parameter 070 **Unit type**

Device type is displayed

Parameter 071 **Nominal output current**

The nominal unit current is displayed in [A]

Parameter 072 **DIM slot option**

Displays the Drive ID module type which is used in the Drive ID module slot X3

Parameter value	Type of the Drive ID module
0	No Drive-ID module
1 – 9	Reserved
10	DT/DV/400/50
11	Reserved
12	DRS/400/50
13	DRE400/50
14	DRS/460/60
15	DRE/460/60
16	DRS/DRE/380/60 (ABNT)
17	DRS/DRE/400/50 (DR global)
18	Reserved
19	DRP/400/50
20	DRP/460/50
21 – 31	Reserved

Display of the part number and the data set version on the DIM module

Parameter 076 **Basic unit firmware**

Displays the part number and version of the unit firmware

Parameter 700 **Operating mode**

The selected operating mode is displayed

Parameters 080 – 084

Error t-0 – t-4

The unit saves the diagnostic data when a fault occurs. The last five errors are displayed in the error memory.

Parameter 094

PO 1 Setpoint (display value)

Process data output word 1

Parameter 095

PO 2 Setpoint (display value)

Process data output word 2

Parameter 096

PO 3 Setpoint (display value)

Process data output word 3

Parameter 097

PI 1 Actual value (display value)

Process data input word 1

Parameter 098

PI 2 Actual value (display value)

Process data input word 2

Parameter 099

PI 3 Actual value (display value)

Process data input word 3

8.8.2 Setpoints/ramp generators

Parameter 100

INFORMATION

Parameter *P100* can only be changed if

- All binary inputs are set to "0"
- And DIP switches S1/1 to S1/4 are deactivated by parameter *P102*.

Control setpoint source

- When selecting "Binary", the drive is controlled via the binary input terminals.
  - If the mechanical controls f1 and f2 are not deactivated (see parameter *P102*), the setpoints are specified with setpoint potentiometer f1 and switch f2.
  - If the mechanical controls f1 and f2 are deactivated (see parameter *P102*), the setpoints are specified by selecting setpoints n_f1 or n_f2 (conditions see parameters *P160*/*P161*).
- When selecting "RS-485", the drive is controlled via the binary input terminals and the bus control word. The setpoint is selected via the system bus.

Parameter 102

Deactivating mechanical controls

Use this bit-coded selection box to deactivate the mechanical controls of the MOVIMOT® inverter. The value of the parameter set at the factory enables all mechanical controls.

Bit	Meaning	Note	
0	Reserved		
1	Deactivating the DIP switches S1/1 – S1/4 (RS485 address)	Bit not set:	DIP switches S1/1 – S1/4 active
		Bit set:	DIP switches S1/1 – S1/4 not active Setting the RS-485 address, RS-485 group address and control setpoint source using parameters *P810*, *P811*, and *P100*
2-4	Reserved		
5	Deactivating the DIP switch S1/5 (motor protection)	Bit not set:	DIP switch S1/5 active
		Bit set:	DIP switch S1/5 not active: Switching the motor protection function on/off using parameter *P340*
6	Reserved		
7	Deactivating the DIP switch S1/7 (PWM cycle frequency)	Bit not set:	DIP switch S1/7 active
		Bit set:	DIP switch S1/7 not active Setting the PWM cycle frequency using parameter *P860*
8	Deactivating the DIP switch S1/8 (no-load damping)	Bit not set:	DIP switch S1/8 active
		Bit set:	DIP switch S1/8 not active Activation/deactivation of no-load damping using parameter *P325*
9	Reserved		
10	Deactivating the DIP switch S2/2 (releasing the brake)	Bit not set:	DIP switch S2/2 active
		Bit set:	DIP switch S2/2 not active Activation/deactivation of brake release without drive enable using parameter *P738*
11	Deactivating the DIP switch S2/3 (operating mode)	Bit not set:	DIP switch S2/3 active
		Bit set:	DIP switch S2/3 not active Selecting the operating mode using parameter *P700*
12	Deactivating the DIP switch S2/4 (Speed monitoring)	Bit not set:	DIP switch S2/4 active
		Bit set:	DIP switch S2/4 not active Activation/deactivation of speed monitoring using parameter *P500*
13	Deactivating the setpoint potentiometer f1	Bit not set:	Setpoint potentiometer f1 active
		Bit set:	Setpoint potentiometer f1 not active Setting the setpoint and the maximum speed using parameters *P160* and *P302*
14	Deactivating switch f2	Bit not set:	Switch f2 active
		Bit set:	Switch f2 not active Setting the setpoint and the minimum speed using parameters *P161* and *P301*
15	Deactivating switch t1	Bit not set:	Switch t1 active Acceleration ramp time = deceleration ramp time
		Bit set:	Switch t1 not active Setting the ramp times using parameters *P130* and *P131*

Parameter 130 **Ramp t11 up**

- When using MOVIMOT® with binary control, the acceleration ramp t11 up is only valid if:
  - Switch t1 is deactivated, i.e. if *P102:15* = "1".
- When using MOVIMOT® with RS-485 control, the acceleration ramp t11 up is only valid if:
  - Switch t1 is deactivated, i.e. if *P102:15* = "1"
  - And the drive is running in 2PD mode.

The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).

Parameter 131 **Ramp t11 down**

- When using MOVIMOT® with binary control, the deceleration ramp t11 down is only valid if:
  - Switch t1 is deactivated, i.e. if *P102:15* = "1".
- When using MOVIMOT® with RS-485 control, the deceleration ramp t11 down is only valid if:
  - Switch t1 is deactivated, i.e. if *P102:15* = "1"
  - And the drive is running in 2PD mode.

The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).

Parameter 134 **Ramp t12 up = down**

Acceleration and deceleration ramp at S pattern

The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).

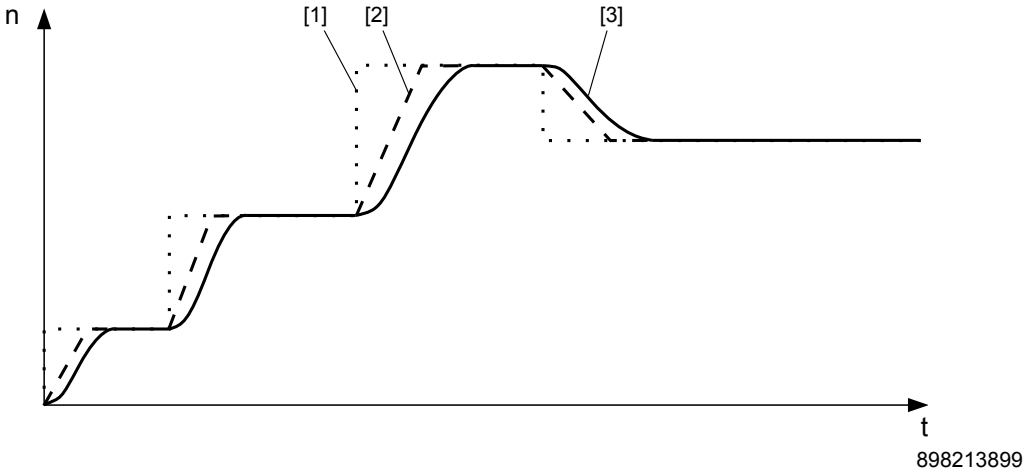
The ramp time sets the acceleration and deceleration if parameter *P135 S pattern t12* has been set to grade 1, grade 2 or grade 3.

INFORMATION

It is not possible to determine a setpoint via process data when parameter *P135 S pattern t12* is activated.

Parameter 135 **S pattern t12**

This parameter determines the pattern grade (1 = low, 2 = medium, 3 = high) of the ramp. The S pattern is used for rounding off the ramp and allows for a soft acceleration of the drive in the event of a setpoint change. The following figure shows the effect of the S pattern:



[1] Setpoint selection
[2] Speed without S pattern
[3] Speed with S pattern

INFORMATION

Once started, an S pattern phase can be interrupted with stop ramp t13.

If the setpoint is reduced or the enable signal is revoked, the started S pattern phase is completed. Thus the drive can accelerate until the end of the S pattern phase despite the setpoint reduction.

Parameter 136 **Stop ramp t13**

The stop ramp time is effective for a stop along the stop ramp.

The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).

Parameter 160 **Setpoint n_f1**

The setpoint n_f1 is valid if

- The setpoint potentiometer f1 is deactivated, i.e. when parameter *P102:13* = "1",
- Parameter *P600 Binary inputs* = "0",
- And the signal "0" is present at terminal f1/f2 X6: 7,8.

Parameter 161 **Setpoint n_f2**

The setpoint n_f2 is valid if

- Switch f2 is deactivated, i.e. when parameter *P102:14* = "1",
- Parameter *P600 Binary inputs* = "0",
- And the signal "1" is present at terminal f1/f2 X6: 7,8.

Parameters 170 – 173

Fixed setpoints n0 – n3

The fixed setpoints n0 – n3 are valid when parameter *10096.34 Terminal assignment* is set to "1" = terminal configuration 2 (fixed setpoint selection).

You can then select fixed setpoints n0 – n3 using the programmed functionality of the input terminals.

The sign of the fixed setpoint determines the direction of rotation of the motor.

Parameter	Active setpoint	Status Terminal L ↶ X6:9,10	Status Terminal f1/f2 X6:7,8
P170	n0	OFF	OFF
P171	n1	ON	OFF
P172	n2	OFF	ON
P173	n3	ON	ON

8.8.3 Motor parameters

Parameter 300

Start/stop speed

This parameter defines the smallest speed request which the inverter sends to the motor when enabled. The transition to the speed determined in the setpoint selection is made using the active acceleration ramp. When the enable signal is removed, the parameter determines the frequency as of which the MOVIMOT® inverter detects the motor standstill and starts to engage the brake.

Parameter 301

Minimal speed (when switch f2 is deactivated)

This parameter defines the minimum speed n_{min} of the drive.

The drive does not fall below this speed value even when the setpoint specification is slower than the minimum speed (exception: direction of rotation reversal or drive stop).

Parameter 302

Maximum speed (when switch f1 is deactivated)

This parameter defines the maximum speed n_{max} of the drive.

The drive does not exceed this speed value even when the setpoint specification is higher than the maximum speed.

If you set $n_{min} > n_{max}$, then the value set in n_{min} applies to the minimum speed and the maximum speed.

Parameter 303

Current limit

The internal current limitation is based on the apparent output current. The inverter automatically decreases the current limit internally in the field weakening range to provide stall protection for the connected motor.

Parameter 320

Automatic adjustment

When the parameter is activated, the motor is calibrated each time the operating status changes to ENABLE.

Parameter 321 **Boost**

If parameter *P320 Automatic adjustment* = "On", the inverter sets parameter *P321 BOOST* automatically. This parameter does not usually have to be set manually.

In exceptional cases, manual setting may be necessary to increase the breakaway torque.

Parameter 322 **IxR adjustment**

If parameter *P320 Automatic adjustment* = "On", the inverter sets parameter *P322 IxR adjustment* automatically. Only specialists are permitted to change this parameter manually to optimize the settings.

Parameter 323 **Premagnetization**

The pre-magnetization time allows for a magnetic field is built up in the motor when the inverter is enabled.

Parameter 324 **Slip compensation**

Slip compensation increases the speed accuracy of the motor. Enter the nominal slip of the connected motor manually.

The slip compensation is designed for a load moment of inertia / motor moment of inertia ratio smaller than 10. If control starts oscillating, you must reduce the slip compensation or set it to 0, if required.

Parameter 325 **No-load vibration damping** (when DIP switch S1/8 is deactivated)

No-load vibration damping can be activated when the motor tends to be unstable under no load conditions.

Parameter 340 **Motor protection** (when DIP switch S1/5 is deactivated)

Activation / deactivation of the thermal protection model for MOVIMOT®

When this function is activated, MOVIMOT® takes over the thermal protection of the drive by electronic means.

Parameter 341 **Type of cooling**

This parameter is used for defining the cooling type (fan cooled or forced cooling) that is the basis for calculating the motor temperature.

Parameter 347 **Motor cable length**

This parameter is used for defining the motor cable length (= length of the SEW hybrid cable between MOVIMOT® and motor) that is the basis for calculating the motor temperature. This parameter must only be changed if the unit is installed close to the motor.

8.8.4 Control functions

Parameter 500 **Speed monitoring** (when DIP switch S2/4 is deactivated)

With MOVIMOT®, speed monitoring is performed by evaluating operation at the current limit. Speed monitoring is triggered when the current limit is maintained for the duration of the set deceleration time (parameter *P501*).

Parameter 501 **Delay time**

The set current limit can be reached during acceleration, deceleration, or load peaks.

You can prevent the speed monitoring from responding too sensitively by setting the deceleration time. The current limit must be maintained for the duration of the set deceleration time before monitoring responds.

Parameter 522 **Mains phase failure check**

NOTICE

Deactivating the mains phase failure monitoring can damage the unit if conditions are unfavorable.

Damage to the inverter.

- Deactivate the phase failure monitoring function only in case of brief asymmetries in the line voltage.
- Make sure that the MOVIMOT® drive is always connected to all 3 phases of the supply system.

This monitoring function can be deactivated to prevent the phase failure check from triggering in case of asymmetrical supply systems.

Parameter 523 **Mains off monitoring**

Use this parameter to adjust the mains off monitoring function of the inverter for operation with MOVITRANS®.

8.8.5 Terminal assignment

Parameter 600 **Terminal configuration**

INFORMATION

Parameter *P600* can only be changed if all binary inputs are set to "0".

Use this parameter to select the configuration of binary input terminals.

The following tables show the functions of the binary input terminals in relation to the control setpoint source and the terminal configuration:

Control / setpoint source "Binary"				
Terminal configuration		Binary input terminals		
		f1/f2 X6:7,8	L ↺ X6:9,10	R ↻ X6:11,12
0:	Terminal configuration 1	Setpoint changeover "0" signal: setpoint f1 "1" signal: setpoint f2	CCW/stop "0" signal: Stop "1" signal: Counterclockwise rotation	CW/stop "0" signal: Stop "1" signal: Clockwise rotation
1:	Terminal configuration 2	Selection of fixed setpoints Fixed setpoint n0: **Signal "0", "0"** parameter *P170* Fixed setpoint n1: **Signal "0", "1"** parameter *P171* Fixed setpoint n2: **Signal "1", "0"** parameter *P172* Fixed setpoint n3: **Signal "1", "1"** parameter *P173*		Enable/stop "0" signal: Stop "1" signal: Enable
2:	Terminal configuration 3	Setpoint changeover "0" signal: setpoint f1 "1" signal: setpoint f2	/External error "0" signal: Ext. Error "1" signal: no ext. Error	Enable/stop "0" signal: Stop "1" signal: Enable

Control / setpoint source "RS-485"				
Terminal configuration		Binary input terminals		
		f1/f2 X6:7,8	L ↺ X6:9,10	R ↻ X6:11,12
0:	Terminal configuration 1	no function	CCW/stop "0" signal: Stop "1" signal: Enable CCW	CW/stop "0" signal: Stop "1" signal: Enable CW
1:	Terminal configuration 2	no function	no function	Enable/stop "0" signal: Stop "1" signal: Enable CW and CCW operation
2:	Terminal configuration 3	no function	/External error "0" signal: Ext. Error "1" signal: no ext. Error	Enable/stop "0" signal: Stop "1" signal: Enable CW and CCW operation

Parameter 620 **Function of the signal relay K1**

⚠ WARNING

Danger due to unexpected starting of the drive when you use the signal relay K1 for controlling the brake.

Severe or fatal injuries

- When the signal relay K1 is used for controlling the brake, parameter *P620* must be set to 5 "Brake released".
- Before using the signal relay K1 for controlling the brake, check the parameter setting.

Use this parameter to select the function of the signal relay K1.

Effect when	"0" signal	"1" signal
0: No function	–	–
2: Ready	Not ready	Ready
3: Output stage on	Unit inhibited	Unit enabled, motor energized
4: Rotating field on	No rotating field **Important: Dangerous voltages can still be present at the MOVIMOT® inverter output.**	Rotating field
5: Brake released	Brake applied	Brake released
6: Brake applied	Brake released	Brake applied

8.8.6 Control functions

Parameter 700 **Operating mode** (when DIP switch S2/3 is deactivated)

This parameter is used to set the basic operating mode of the inverter.

- **VFC / V/f characteristic curve:**

  Default setting for asynchronous motors. This setting is suitable for general applications such as conveyor belts, trolleys, etc.

- **VFC hoist:**

⚠ WARNING

Danger due to unexpected starting of the drive when you use the signal relay K1 for controlling the brake.

Severe or fatal injuries

- If the K1 signal relay is used to control the brake, do not change the parameters of the signal relay function.
- Before changing parameter *P700*, check whether the signal relay is used for controlling the brake.

The hoist function automatically provides all functions necessary for operating a simple hoist application.

For the hoist function to be performed correctly, the motor brake must be controlled using the inverter.

The VFC hoist operating mode affects the following parameters:

No.	Index dec.	Subindex dec.	Name	Value
300	8515	0	Start/stop speed	= 60 rpm If the start/stop speed is set to less than 60 rpm.
301	8516	0	Minimum speed	= 60 rpm If the minimum speed is set to less than 60 rpm
303	8518	0	Current limit	= Nominal motor current If the current limit is set to a lower value than the nominal motor current
323	8526	0	Premagnetization	= 20 ms If pre-magnetization is set to a lower value than 20 ms
500	8557	0	Speed monitoring	= 3: Motor/regenerative
620	8350	0	Signal output K1	= 5: Brake released
731	8749	0	Brake release time	= 200 ms If the brake release time is set to a lower value than 200 ms
732	8585	0	Brake application time	= 200 ms If the brake application time is set to a lower value than 200 ms
738	8893	0	Activation of brake release without drive enable	= 0: OFF

In VFC hoist operating mode, the MOVIMOT® inverter checks whether the values of these parameters are permitted.

The speed monitoring function cannot be deactivated in VFC hoist operating mode.

The function "Brake release without drive enable" cannot be activated in VFC hoist operating mode.

The function of the signal relay output can be parameterized.

- **VFC DC braking / V/f DC braking:**

⚠ WARNING

Danger due to uncontrolled braking. With DC braking, guided stops are not possible and certain ramp values cannot be observed.

Severe or fatal injuries

- Use a different operating mode.

This setting means the asynchronous motor brakes by using current injection. The motor brakes without braking resistor on the inverter.

Parameter 710 **Standstill current**

When the standstill current function is activated, the inverter injects a current in the motor at standstill.

The standstill current fulfills the following functions:

- When the ambient temperature of the motor is low, the standstill current prevents the risk of condensation and freezing of the brake. Set the current level in such a way that the motor will not overheat.
- If you have activated the standstill current, you can enable the motor without pre-magnetization.

When the standstill function is activated, the output stage remains enabled even in the "NO ENABLE" status to inject the motor standstill current.

In the event of a fault, the motor might no longer be energized depending on the fault response.

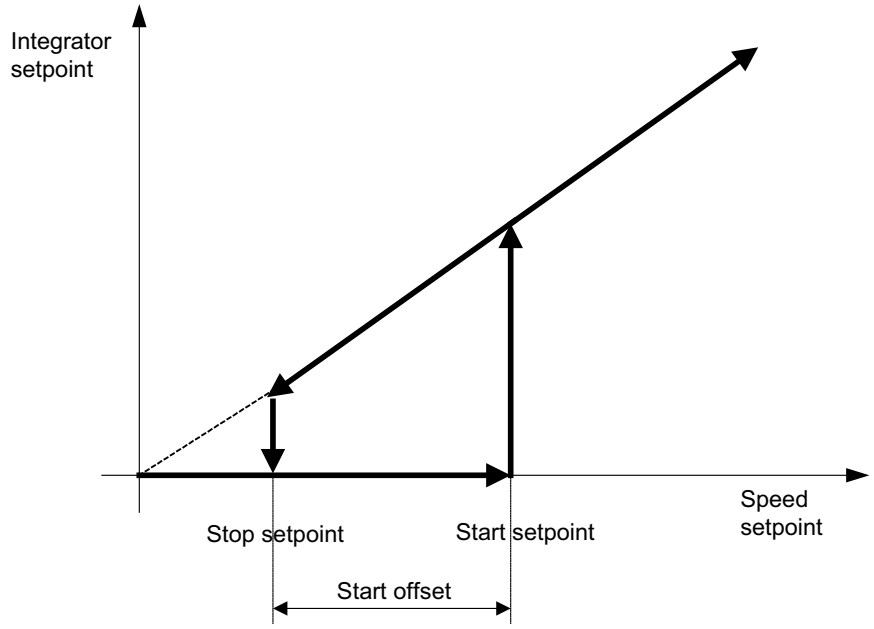
Parameters 720 – 722 **Setpoint stop function**

Stop setpoint

Start offset

If the setpoint stop function is activated, the inverter is enabled when the speed setpoint is larger than the stop setpoint + start offset.

Inverter enable is revoked when the speed setpoint falls below the stop setpoint.



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Parameter 731 **Brake release time**

This parameter is used for defining how long the motor is to run at minimum speed after pre-magnetization ends. This time is necessary for opening the brake completely.

Parameter 732 **Brake application time**

You can use this parameter to set the time required for the mechanical brake to apply.

Parameter 738 **Activation of brake release without drive enable**

(when DIP switch S2/2 is deactivated)

If this parameter is set to the value "ON", the brake can be released even if the drive is not enabled. For detailed information, refer to chapter "DIP switch S2/2" (page 64).

This functionality is only available when the motor brake is controlled via the inverter.

The brake is always applied when the unit is not ready for operation.

The brake cannot be released when the drive is not enabled in conjunction with the hoisting function.

Parameter 770 **Energy-saving function**

If this parameter is set to "OFF", the inverter reduces the no-load current.

8.8.7 Unit functions

Parameter 802 **Factory setting**

If you set this parameter to "delivery status", all parameters

- that have a factory setting value
- and that can not be set at DIP switches S1/S2 or switches t1/f2

are set to this factory setting value.

For those parameters that can be set at the DIP switches S1/S2 or at switches t1/f1, the setting of the mechanical setting element becomes active when the factory setting "Delivery state" is selected.

Parameter 803 **Parameter lock**

If this parameter is set to "ON", you cannot change any of the parameters except the parameter lock. This setting makes sense once you have finished starting up the unit and optimizing the parameters. You can only change the parameters again when this parameter is set to "OFF".

Parameter 805 **Startup mode**

Parameterization of the startup mode

- **"Easy" mode**

  When selecting "Easy" mode, DIP switches S1, S2 and switches f2, t1 are used for starting up MOVIMOT® quickly and easily.

- **"Expert" mode**

  "Expert" mode includes additional parameters.

Parameter 810 **RS-485 address** (when DIP switches S1/1 – S1/4 are deactivated)

Use this parameter to set the RS-485 address of the MOVIMOT® inverter.

Parameter 811 **RS-485 group address** (when DIP switches S1/1 – S1/4 are deactivated)

Use this parameter to set the RS-485 group address of the MOVIMOT® inverter.

Parameter 812 **RS-485 timeout interval**

Use this parameter to set the timeout monitoring interval of the RS-485 interface.

Parameter 830 **Error response for external error**

Use this parameter to determine the error response that is triggered when the signal at terminal X6: 9,10 (error code 26) is cancelled, see parameter P600 "Terminal configuration 3".

Parameter 832 **Motor overload error response**

Use this parameter to determine the error response that is performed in the event of a motor overload (error code 84).

Parameter 840 **Manual reset**

If an error is present at the MOVIMOT® inverter, you can acknowledge the error by setting this parameter to "ON". Once the error has been reset, the parameter is set automatically to "OFF" again. If the power section does not indicate an error, setting the parameter to "ON" has no effect.

Parameter 860 **PWM frequency** (when DIP switch S1/7 is deactivated)

This parameter is used to set the maximum cycle frequency at the inverter output. The cycle frequency can change automatically depending on the unit utilization.

Parameter 870 **Setpoint description PO 1**

Displays the assignment of the process data output word PO 1

Parameter 871 **Setpoint description PO 2**

Parameterization of the assignment of the process data output word PO 2

The following assignments are available:

Setpoint speed:	The setpoint speed is set absolutely.	
	Coding:	1 digit = 0.2 rpm
	Example 1:	CW operation with 400 rpm:
	Calculation:	$400/0.2 = 2000_{dec} = 07D0_{hex}$
	Example 2:	CCW operation with 750 rpm:
	Calculation:	$-750/0.2 = -3750_{dec} = F15A_{hex}$
Setpoint speed [%]	The speed setpoint is given as a relative value in percentage and refers to maximum speed set using the setpoint potentiometer f1.	
	Coding:	$C000_{hex}$ = -100% (counterclockwise direction) 4000_{hex} = +100% (CW rotation) → 1 digit = 0.0061%
	Example:	80 % f_{max}, CCW rotation:
	Calculation:	$-80\ \% / 0{,}0061 = -13115_{dec} = CCC5_{hex}$

Parameter 872 **Setpoint description PO 3**

Displays the assignment of the process data output word PO 3

Parameter 873 **Actual value description PI 1**

Displays the assignment of the process data input word PI 1

Parameter 874 **Actual value description PI 2**

Parameterization of the assignment of the process data input word PI 2

The following assignments are available:

Actual speed:	Current speed actual value of the drive in rpm Coding: 1 digit = 0.2 rpm
Output current:	Instantaneous output current of the unit in % of I_N Coding: 1 digit = 0.1 % I_N
Active current:	Instantaneous active current of the unit in % of I_N Coding: 1 digit = 0.1 % I_N
Actual speed [%]:	Current speed actual value of the drive in % of setpoint potentiometer f1 or of n_{max} Coding: 1 digit = 0.0061 % -100 % – +100 % = 0xC000 – 0x4000

Parameter 875 **Actual value description PI 3**

(see sec. "Process input data" (page 108))

Displays the assignment of the process data input word PI 3

Parameter 876 **PO data enable**

YES: The process output data sent by the fieldbus controller becomes effective immediately.

NO: The last valid process output data remain in effect.

INFORMATION

The PO data is inhibited if the assignment of process data output word PO2 is changed. It must be re-enabled in parameter *P876*.

8.8.8 Parameters that depend on mechanical controls

The following mechanical controls influence the user parameters:

- DIP switch S1
- DIP switch S2
- Setpoint potentiometer f1
- Switch f2
- Switch t1

INFORMATION

Parameter *P100* can only be changed if

- All binary inputs are set to "0"
- And DIP switches S1/1 to S1/4 are deactivated by parameter *P102*.

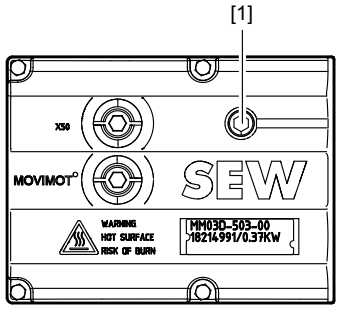
Mechanical control	Influenced Parameter	Effect of parameter *P102* Bit	
DIP switches S1/ 1 – S1/4	*P810* *RS-485 address* *P811* *RS-485 group address* *P100* *Control setpoint source*	1	Bit not set: Setting RS-485 address, RS-485 group address and control / setpoint source at DIP switch S1/1 – S1/4
			Bit set: Setting the RS-485 address, RS-485 group address and control / setpoint source using parameters
DIP switch S1/5	*P340* *Motor protection*	5	Bit not set: Activation/deactivation of the motor protection function at DIP switch S1/5
			Bit set: Activation/deactivation of motor protection function using parameters
DIP switch S1/7	*P860* *PWM frequency*	7	Bit not set: Selecting the PWM frequency at DIP switch S1/7
			Bit set: Selecting the PWM frequency using parameters
DIP switch S1/8	*P325* *No-load vibration damping*	8	Bit not set: Activation/deactivation of the no-load vibration damping function at DIP switch S1/8
			Bit set: Activation/deactivation of no-load vibration damping using parameters
DIP switch S2/2	*P738* *Brake release without drive enable*	10	Bit not set: Activation/deactivation of the function "Brake release without drive enable" at DIP switch S2/2
			Bit set: Activation/deactivation of the function "Brake release without drive enable" using parameters
DIP switch S2/3	*P700* *Operating mode*	11	Bit not set: Selecting the operating mode at DIP switch S2/3
			Bit set: Selecting the operating mode using parameters

Mechanical control	Influenced Parameter	Effect of parameter *P102* Bit	
DIP switch S2/4	*P500* *Speed monitoring*	12	Bit not set: Activation/deactivation of the speed monitoring function at DIP switch S2/4
			Bit set: Activation/deactivation of the speed monitoring using parameters
Setpoint potentiometer f1	*P302* *Maximum speed*	13	Bit not set: Setting the maximum speed at setpoint potentiometer f1
			Bit set: Setting the maximum speed using parameters
Switch f2	*P301* *Minimum speed*	14	Bit not set: Setting the minimum speed at switch f2
			Bit set: Setting the minimum speed using parameters
Switch t1	*P130* *Acceleration ramp* *P131* *Deceleration ramp*	15	Bit not set: Setting the ramps at switch t1
			Bit set: Setting the ramps using parameters

9 Operation

9.1 Operating display

The status LED is located on the top of the MOVIMOT® inverter.



[1] MOVIMOT® status LED 459759755

9.1.1 Meaning of the status LED states

The three-color status LED indicates the operating and error states of the MOVIMOT® inverter.

LED color	LED status	Operating status	Description
–	Off	Not ready	No 24 V power supply
Yellow	Flashes steadily	Not ready	Self-test phase active or 24 V power supply present but supply voltage not OK
Yellow	Flashing evenly, fast	Ready	Releasing the brake without drive enable active (only with S2/2 = "ON")
Yellow	Steady light	Ready, but unit inhibited	24 V power supply and supply voltage OK, but no enable signal If drive does not run when enable signal is present - check startup!
Yellow	2x flashing, break	Ready, but manual operation without unit enable	24 V power supply and supply voltage OK Stop manual mode to activate automatic mode
Green /yellow	Flashing with alternating colors	Ready, but timeout	Faulty communication with cyclical data exchange
Green	Steady light	Unit enabled	Motor in operation
Green	Flashing evenly, fast	Current limit active	Drive operating at current limit
Green	Flashes steadily	Ready	Standstill current function active
Red	Steady light	Not ready	Check the 24 V supply. Make sure that there is a smoothed DC voltage with low ripple (residual ripple max. 13%) present

Status LED flash codes

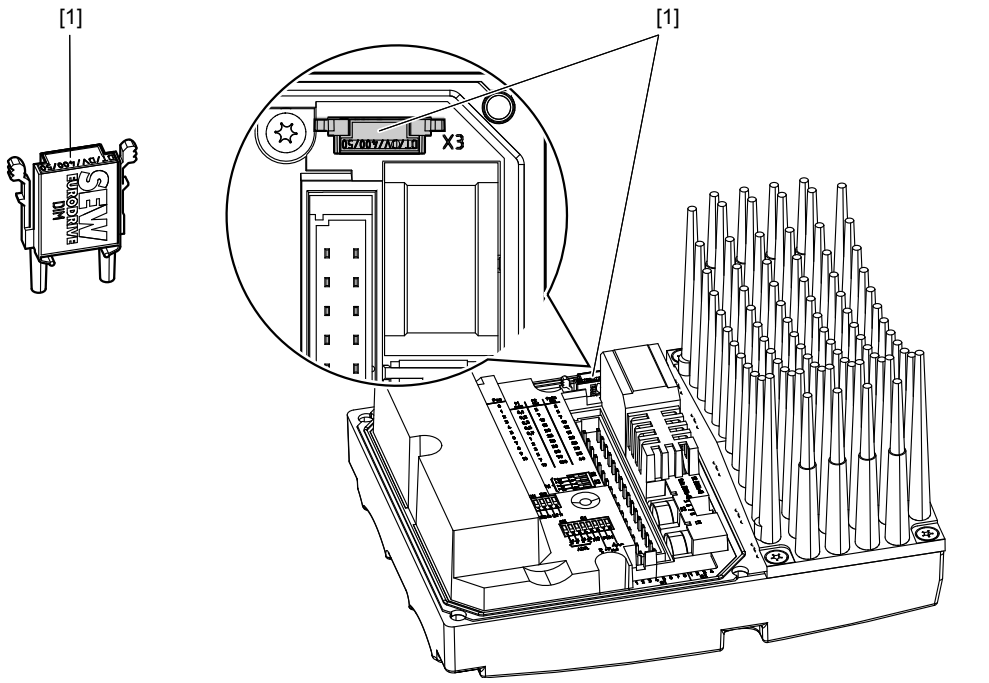
Flashing steadily:	LED 600 ms on, 600 ms off
Flashing evenly, fast:	LED 100 ms on, 300 ms off
Flashing with alternating colors:	LED 600 ms green, 600 ms yellow

For a description of the error statuses, refer to sec. "Meaning of the status LED states" (page 172).

9.2 Drive ID module

The pluggable Drive ID module is installed in the basic unit.

The following figure shows the Drive ID module and its position in the MOVIMOT® inverter.



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[1] Drive-ID module

The Drive ID module receives a memory module on which the following information is stored:

- Motor data
- Brake data
- User parameters

If a MOVIMOT® inverter has to be replaced, you can re-startup the system by simply re-plugging the Drive ID module without a PC or data backup.

INFORMATION

If, during a unit replacement

- the DIP switch setting is not transmitted correctly,
- or a MOVIMOT® inverter with a different part number is used (e.g. with a different power level),

The MOVIMOT® inverter detects a change in configuration. This may reinitialize certain startup parameters.

This is why the MOVIMOT® inverter must only be replaced with a MOVIMOT® inverter with the **same part number**.

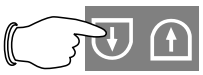
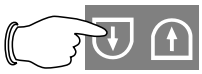
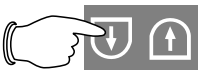
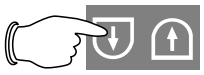
For information regarding unit replacements, refer to chapter "Unit replacement" (page 178).

9.3 Keypads

INFORMATION

For notes on startup with the MBG11A or MLG..A options, refer to sec. "Startup with the MBG11A or MLG..A options" (page 93).

The following MOVIMOT® functions can be executed with the MBG11A and MBG..A keypads:

Function	Explanation
Display	Negative display value, e.g. = CCW operation Positive display value; e.g., = CW operation The display value is based on the speed set using the setpoint potentiometer f1. Example: Display "50" = 50 % of the speed set with the setpoint potentiometer. **Important: If the display is "0," the drive is rotating at f_{min}.**
Increasing the speed	For CW direction: For CCW direction: 
Reducing the speed	For CW direction: For CCW direction:
Stopping the MOVIMOT® drive	Pressing both keys at the same time: Display =
Starting the MOVIMOT® drive	**or**  **Important: After enable, the MOVIMOT® drive accelerates to the value and direction of rotation saved last.**
Change direction of rotation from CW to CCW	1.  Until display = 2. Press  again to change the direction of rotation from CW to CCW.
Change direction of rotation from CCW to CW	1. Until display = 2. Press again to change the direction of rotation from CCW to CW.
Memory function	When the mains is switched off and then on again, the value set last is saved if the 24 V supply has been present for at least 4 seconds after the last setpoint change.

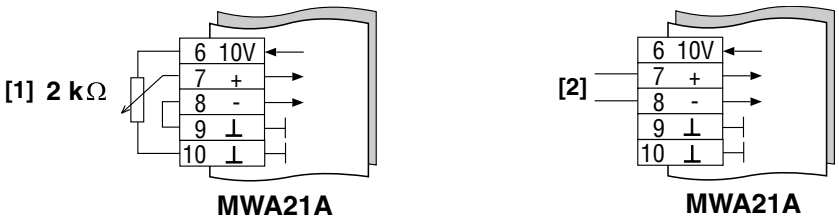
9.4 MWA21A setpoint converter

INFORMATION

- For notes on connecting the MWA21A option, refer to sec. "Connection of option MWA21A" (page 49).
- For notes on startup of the MWA21A option, refer to sec. "Startup with option MWA21A" (page 95).

9.4.1 Control

The analog signal at terminals 7 and 8 of the MWA21A option is used for controlling the speed of the MOVIMOT® drive from f_{min} to f_{max}.



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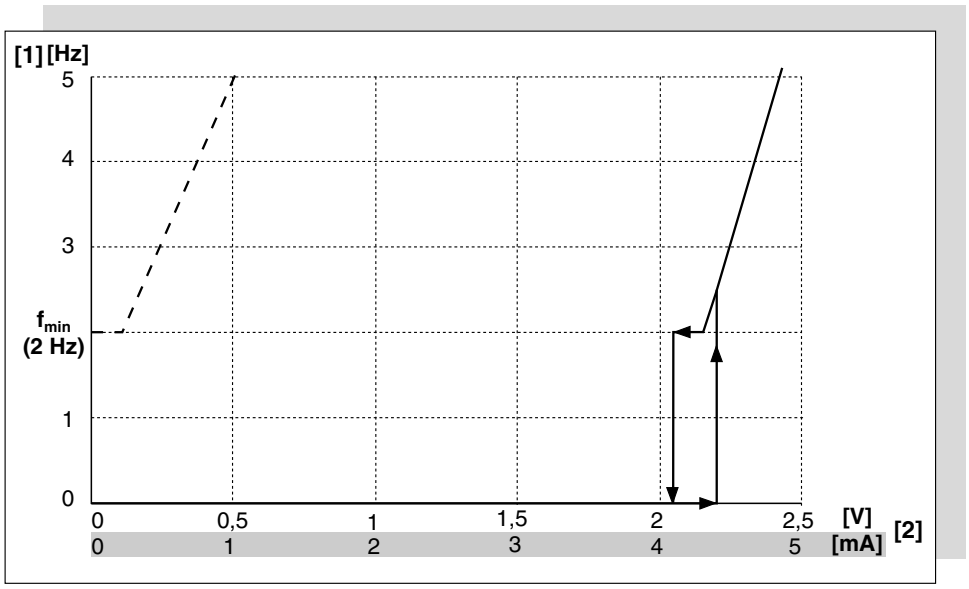
[1] Potentiometer using the 10 V reference voltage (alternative 5 kΩ)
[2] Potential-free analog signal

9.4.2 Setpoint stop function:



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Setting:

– – – – **0...10 V / 0...20 mA**
——— **2...10 V / 4...20 mA**

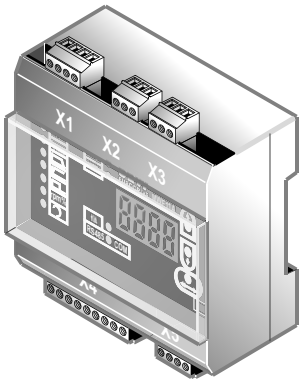
[1] Output frequency
[2] Setpoint

9.5 MWF11A setpoint converter

INFORMATION

- For more information about connecting the MWF11A option, refer to chapter "Connection of option MWF11A" (page 50).
- For notes on startup of the MWF11A option, refer to sec. "Startup with option MWF11A" (page 98).

The following figure shows the MWF11A setpoint converter:



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9.5.1 Functional description

The MWF11A setpoint converter converts a setpoint (frequency or analog input) and control signals into an RS-485 protocol.

This can be used to control the MOVIMOT® remotely from the control cabinet. Up to 31 MOVIMOT® drives can be controlled at the same time (broadcasting).

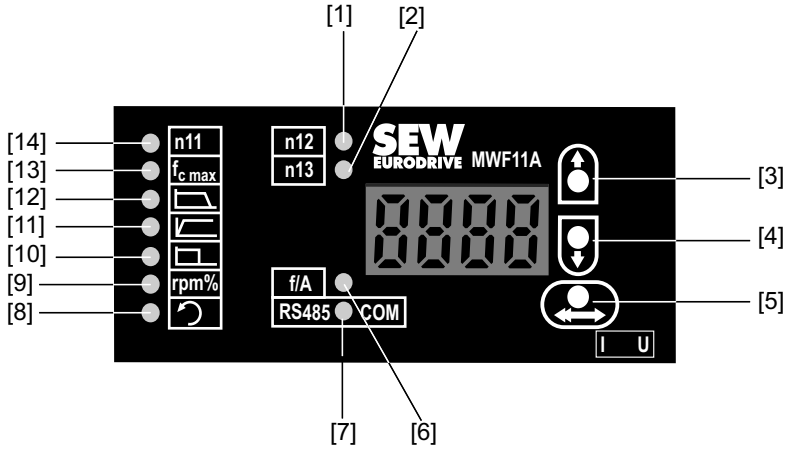
The MWF11A setpoint converter can be operated in the following modes:

- Broadcast mode (B mode)
- Point-to-point (p mode)
- Point-to-point with alternately 2PD/3PD

Run mode	Description
Broadcast mode (B mode)	• In broadcast mode, you can control a maximum of 31 MOVIMOT® drives via RS-485 with 1 MWF11A setpoint converter. • The MOVIMOT® inverter does not send back any status messages (via RS-485) to the MWF11A setpoint converter.
Point to point (P mode)	• In point-to-point mode, you can control only 1 MOVIMOT® drive with 1 MWF11A setpoint converter. • The setpoint converter evaluates error messages and the actual speed of the MOVIMOT® drive. • If an error occurs in the MWF11A setpoint converter or the MOVIMOT® drive, the "/Malfunction" terminal is reset.
Point to point **With alternately 2PD/3PD** (2 PD mode)	• See point-to-point row (p mode) • Differences: – The "/Malfunction" terminal is also active when the MWF11A setpoint converter signals "StbY" (24 V mode). – During initialization, the ramp parameters are written to the MOVIMOT® parameters "t11 up"/"t11 down". The MWF11A setpoint converter only communicates with 3 PD during a braking operation via the rapid stop ramp.

9.5.2 Operating and display elements

The following figure shows the operating and display elements of the MWF11A option:



3285341963

[1] Symbol for fixed setpoint n12
[2] Symbol for fixed setpoint n13
[3] "Up" button for selecting a symbol/changing values
[4] "Down" button for selecting a symbol/changing values
[5] "Confirm" button
[6] Symbol for frequency or analog input
[7] Symbol for communication mode
[8] Symbol for CCW operation
[9] Symbol for status display
[10] Symbol for rapid stop ramp
[11] Symbol for ramp up
[12] Symbol for ramp down
[13] Symbol for frequency at 100% setpoint
[14] Symbol for fixed setpoint n11

9.5.3 Operation

The following table shows the basic operating principle of the MWF11A option:

Selecting a symbol	Select a symbol by pressing the buttons "up" [3] or "down" [4].
Changing values	1. Select a symbol (see above). 2. Use button [5] to switch to the setting mode. 3. Change the value by pressing the buttons "up" [3] or "down" [4]. 4. During the setting process, the value is flashing. Confirm your selection of the value by double-clicking button [5]. The value is stored in a non-volatile memory.
Scaling the step width when changing the values	Press button [5] while changing the values with the "up" [3] or "down" [4] buttons. For information about the step width, see the following pages.

9.5.4 Meaning of the display symbols

The following table shows the meaning of the display symbols:

Symbol	Function
Status display 	**In broadcast mode (B mode):** • **Display:** – As long as there is no enable signal at the terminals, the display will show "StoP". – When the enable signal is present, the display shows the setpoint speed in %. • Unit: Percent • Range: 0.0 - 200.0 • Step width: 0.1
	In point-to-point mode and 2 PD mode: • **Display:** Status of the inverter – "StbY" for 24 V mode – "StoP" for no enable/controller inhibit – "F XX" when the MOVIMOT® inverter tripped with error XX – "E XX" when MWF11A tripped with error XX, see chapter "Diagnostics with MWF11A option" (page 177). – "----" when the communication between the MOVIMOT® inverter and the MWF11A option is interrupted • Unit: Percent • Range: 0.0 % - 200.0 % • Step width: 0.1
Rapid stop ramp 	• **Display:** Rapid stop ramp based on 1500 rpm (50 Hz) • Unit: Seconds • Range: 0.1 – 65 s • Step width: 0.01 s • Fast step width: 0.2 s • Factory setting: 1 s
Ramp up 	• **Display:** Ramp up (CW + CCW) based on 1500 rpm (50 Hz) • Unit: Seconds • Range: 0.1 – 65 s • Step width: 0.01 s • Fast step width: 0.2 s • Factory setting: 5 s
Ramp down 	• **Display:** Ramp down (CW + CCW) based on 1500 rpm (50 Hz) • Unit: Seconds • Range: 0.1 – 65 s • Step width: 0.01 s • Fast step width: 0.2 s • Factory setting: 5 s
Frequency for 100% setpoint 	• **Display:** The input frequency at which the MWF11A option signals a setpoint speed of 100% to the MOVIMOT® inverter. **Example:** 12 kHz are set, 6 kHz are supplied via the frequency input. Speed setpoint = 6 kHz / 12 kHz × 100% = 50%. All results > 200% are limited to 200.0%. When the MOVIMOT® inverter is given a speed setpoint > 100%, the MWF11A option will limit it to 100%. • Unit: kHz • Range: 0.1 – 70.00 kHz • Step width: 0.01 kHz • Fast step width: 0.5 kHz • Factory setting: 10 kHz
Fixed setpoint n11 	• **Display:**Fixed setpoint n11 • Unit: Percent • Range: 0 – 100.0 % • Step width: 0.5 % • Fast step width: 5 % • Factory setting: + 10 %
Fixed setpoint n12 	• **Display:** Fixed setpoint n12 • Unit: Percent • Range: 0 – 100.0 % • Step width: 0.5 % • Fast step width: 5 % • Factory setting: + 50 %

Symbol	Function
Fixed setpoint n13 n13	• **Display:** Fixed setpoint n13 • Unit: Percent • Range: 0 – 100.0 % • Step width: 0.5 % • Fast step width: 5 % • Factory setting: + 100 %
Frequency or analog input f/A	• **Display:** – "F" for frequency input – "A" for analog input (current or voltage) • Factory setting: "F"
Communication mode RS485 COM	• **Display:** – "b" for broadcast mode – "P" for point-to-point mode – "P2" for P2 mode • Factory setting: "B"

9.5.5 Control functions of X4

The following table shows the control functions of terminal X4:

X4:1 CW	X4:2 CCW	X4:3 Enable/rapid stop	X4:4 n11	X4:5 n12	Resulting faults
–	–	"1" → "0"	–	–	Motor decelerates with "rapid stop ramp" and stops
"1" → "0"	"0"	"1"	–	–	Motor decelerates with "ramp down" and stops
"0"	"1" → "0"	"1"	–	–	
"0" → "1"	"1"	"1"	–	–	Motor decelerates with "ramp down" and stops
"1"	"0" → "1"	"1"	–	–	
"0" → "1"	"0"	"1"	"0"	"0"	CW operation with frequency or analog setpoint Depending on symbol: f/A Motor accelerates with "ramp up"
"0"	"0" → "1"	"1"	"0"	"0"	CCW operation with frequency or analog setpoint Depending on symbol: f/A Motor accelerates with "ramp up"
"0" → "1"	"0"	"1"	"1"	"0"	CW operation with fixed setpoint n11 Motor accelerates with "ramp up"
"0"	"0" → "1"	"1"	"1"	"0"	CCW operation with fixed setpoint n11 Motor accelerates with "ramp up"
"0" → "1"	"0"	"1"	"0"	"1"	CW with fixed setpoint n12 Motor accelerates with "ramp up"
"0"	"0" → "1"	"1"	"0"	"1"	CCW with fixed setpoint n12 Motor accelerates with "ramp up"
"0" → "1"	"0"	"1"	"1"	"1"	CW with fixed setpoint n13 Motor accelerates with "ramp up"
"0"	"0" → "1"	"1"	"1"	"1"	CCW with fixed setpoint n13 Motor accelerates with "ramp up"

Terminal X4:6 (error reset)

Errors shown on the display can be reset by connecting 24 V to terminal X4:6 (error reset). Refer to chapter "Diagnostics with MWF11A setpoint converter" for error responses.

Terminal X4:7 (/ malfunction output)

- In B mode, 24 V is always present at terminal X4:7.
- In P mode, GND is only present at terminal X4:7 in case of an error message, otherwise, 24 V are present.
- In 2 PD mode, GND is present at terminal X4:7 in case of an error message or in 24 V operation, otherwise, 24 V are present.

Terminal X4:8 (malfunction output, short-circuit proof)

Terminal X4:8 is internally connected to terminal X4:7 (output, short-circuit proof).

Notes on ramps

B and P mode:

- The MWF11A setpoint converter always sends the ramp via the third process data word.
- When CW or CCW operation is enabled, the ramp is specified even when going from a large setpoint to a smaller one. A ramp integrator cannot be implemented for relative setpoints.
- "Ramp down" is only sent when there is no rapid stop and no enable signal.
- The rapid stop ramp is sent when "rapid stop" 0 V is present at terminal X4:3.

2 PD mode:

- Ramp up and ramp down are initialized in the MOVIMOT® inverter. The MOVIMOT® inverter automatically selects the correct ramp during operation (depending on the setpoint/actual speed). This is why the MWF11A option only sends 2 PD. When you connect the terminals X4:1 (CW) and/or X4:2 (CCW) of the MWF11A option with the terminals (CW) and/or (CCW) of the MOVIMOT® inverter, the MOVIMOT® drive will run with the correct ramp immediately (without communication delay).
- The rapid stop ramp can only be triggered with 3 PD, which results in a delay of 30 ms to 70 ms.

9.6 MOVIMOT® manual operation with MOVITOOLS® MotionStudio

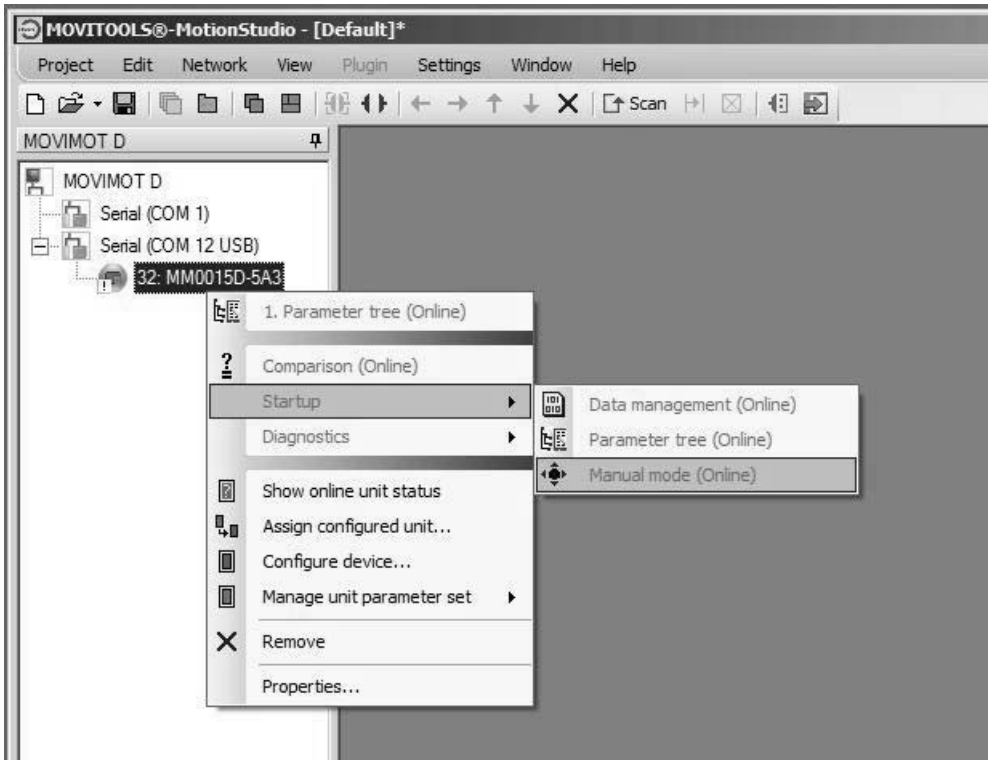
MOVIMOT® drives are equipped with an X50 diagnostics interface for startup and service. It can be used for diagnostics, manual operation and parameter setting.

For manual operation of the MOVIMOT® drive, you can use the manual operation function of the MOVITOOLS® MotionStudio software.

1. Connect the PC to the MOVIMOT® inverter.

   See chapter "PC connection" (page 55).
2. Start MOVITOOLS® MotionStudio and integrate the MOVIMOT® inverter in MOVITOOLS® MotionStudio.

   See chapter "MOVITOOLS® MotionStudio" (page 117).
3. Once the MOVIMOT® inverter is successfully integrated, open the context menu by clicking on the right mouse button and select the menu item "Startup" / "Manual operation".



9007199793805067

The "Manual operation" window opens.

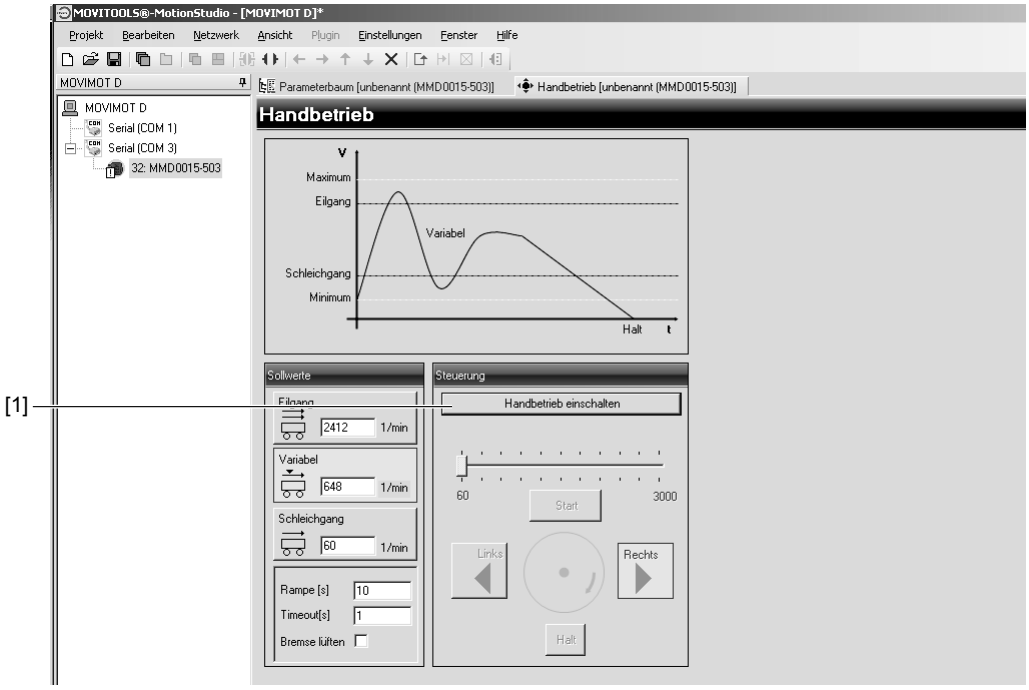
9.6.1 Activating / deactivating manual operation

Activation

Manual operation can only be activated if the MOVIMOT® drive is inhibited.

It can not be activated if

- the brake is released without drive enable
- or if the inverter output stage is enabled to supply a standstill current.



534358795

To activate manual mode, click on the button [Activate manual operation] [1].

The parameter *P097 PI 1 Actual value (display value)* signals to the higher-level controller that manual operation has been activated.

Manual operation remains active even after an error reset or after the 24 V supply has been switched off.

Deactivation

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Before deactivating manual operation, reset the signals at the binary inputs and revoke drive enable via process data.
- Take additional safety precautions depending on the application to avoid injury to people and damage to machinery.

Manual operation is deactivated

- When you click on the [Deactivate manual operation] button
- Or when you close the "Manual operation" window
- Or set parameter *P802 Factory setting* to "Delivery state".

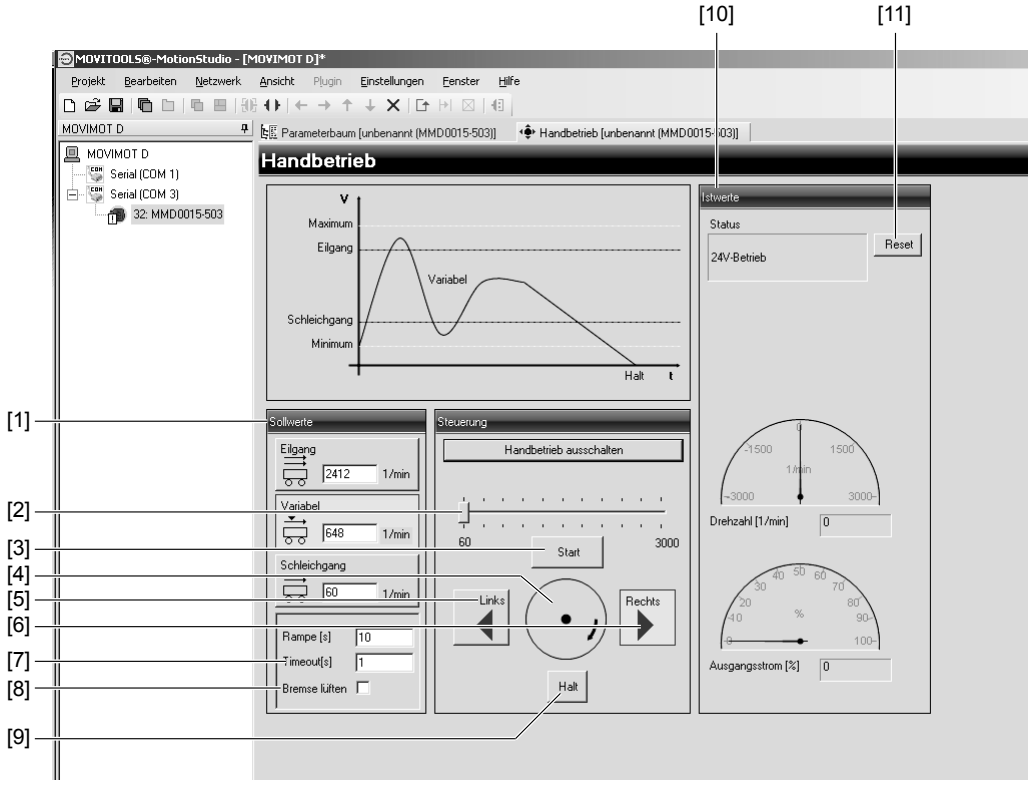
INFORMATION

If you deactivate manual operation,

- The signals at the binary inputs become effective in binary control mode.
- The signals at the binary inputs and the process data become effective in RS-485 control mode.

9.6.2 Control in manual mode

Once manual operation has been successfully activated, you can control the MOVIMOT® drive using the controls in the "Manual operation" window of MOVITOOLS® MotionStudio.



534573835

1. Set the variable setpoint speed with the slide control [2] in the "Control" group.
2. Use the buttons [CW] [6] or [CCW] [5] to specify the direction of rotation.
3. Click on the [Start] button [3] to enable the MOVIMOT® drive.

   The motor axis [4] displayed in the "Control" group symbolizes the direction of rotation and the speed of the motor.
4. Use the [Stop] button [9] to stop the drive.

As an alternative, you can enter the setpoints for rapid and creep speed or the variable speed setpoint directly in the "Setpoints" group [1].

The direction of rotation is determined by the sign (positive = CW operation, negative = CCW operation).

First, enter the setpoint. Then press <ENTER> and click on the button that contains the setpoint input field in order to enable the MOVIMOT® drive.

The group "Actual values" [10] displays the following actual values of the MOVIMOT® drive:

- Status of the MOVIMOT® inverter
- Motor speed in [rpm]
- Output current of the MOVIMOT® inverter in [%] of I_N

On MOVIMOT® drives with a brake, you can release the brake even without drive enable by activating the "Brake release" checkbox [8].

INFORMATION

The brake can only be released without drive enable if

- DIP switch S2/2 = "ON"
- or this function is enabled via parameter *P738*

9.6.3 Reset in manual operation mode

If an error occurs at the MOVIMOT® inverter, you can reset the error by clicking on the [Reset] button [11].

9.6.4 Timeout monitoring in manual operation mode

Timeout monitoring is active during manual operation to prevent uncontrolled operation of the MOVIMOT® drive in case of communication problems.

The timeout interval can be specified in the "Timeout" input field [7].

If communication between MOVITOOLS® MotionStudio and the MOVIMOT® inverter is interrupted longer than this timeout interval,

- The enable signal for the MOVIMOT® drive is revoked.
- And the brake is applied.

Manual mode remains active.

9.7 DBG keypad

9.7.1 Description

Function

You can use the DBG keypad for parameterization and manual operation of MOVIMOT® drives. In addition to that, the keypad displays important information about the state of the MOVIMOT® drive.

Features

- Illuminated plain text display, up to 7 languages can be set
- Keypad with 21 keys
- Can be connected via extension cable DKG60B (5 m)

Overview

Keypad		Language
641532299	DBG60B-01	DE / EN / FR / IT / ES / PT / NL (German / English / French / Italian / Spanish / Portuguese / Dutch)
	DBG60B-02	DE / EN / FR / FI / SV / DA / TR (German / English / French / Finnish / Swedish / Danish / Turkish)
	DBG60B-03	DE / EN / FR / RU / PL / CS (German / English / French / Russian / Polish / Czech)

INFORMATION

For notes on connecting the DBG keypad, refer to chapter "Connection of the DBG keypad" (page 54).

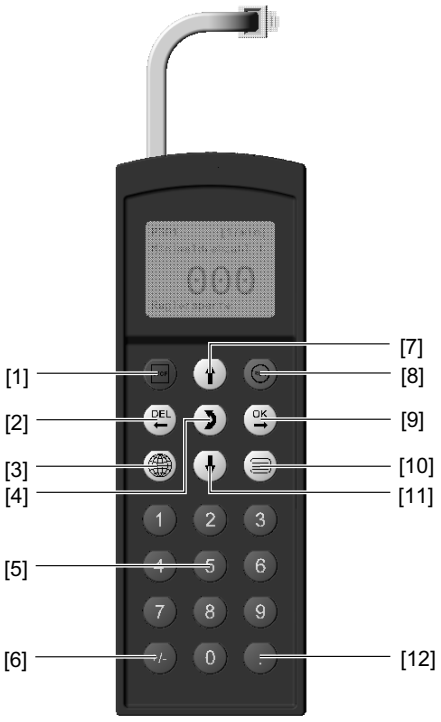
NOTICE Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

Damage to the MOVIMOT® inverter.

- Screw the screw plug back on with the seal after performing parameter setting, diagnostics or manual operation.

Key assignment DBG

The following figure shows the key assignment of the DBG keypad:



341827339

[1]	STOP key	Stop
[2]	DEL key	Delete previous entry
[3]	key	Select language
[4]	key	Change menu
[5]	Keys <0> – <9>	Digits 0 – 9
[6]	+/- key	Sign reversal
[7]	key	Up arrow, moves up to the next menu item
[8]	RUN key	Start
[9]	OK key	OK, confirms the entry
[10]	key	Activate the context menu
[11]	key	Down arrow, moves down to the next menu item
[12]	. key	Decimal point

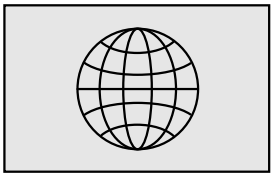
9.7.2 Operation

Selecting a language

1. The following text appears on the display for a few sections when the DBG keypad is switched on for the first time or after activating the delivery status:

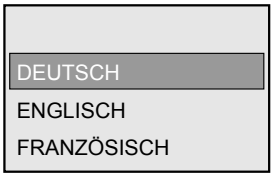
1214344843

   The symbol for language selection then appears on the display.



1214353419

2. Press the key until the desired language appears.
   Press the key to confirm your selection.
   The DBG keypad searches for the connected units and displays them in the unit selection list.



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Context menu

Press the key to go to the context menu.

For the MOVIMOT® MM..D inverter, the following menu items are available in the context menu of the DBG keypad:

- "BASIC VIEW"
- "PARAMETER MODE"
- "MANUAL MODE"
- "COPY TO DBG"
- "COPY IN MM"
- "DBG DELIVERY ST."
- "UNIT SETTINGS"
- "SIGNATURE"
- "EXIT"

Basic display

The menu "BASIC DISPLAY" represents important characteristic values.

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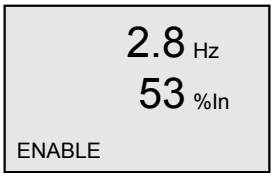
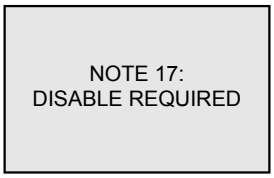
Display for inhibited MOVIMOT® inverter



690392971

Display for enabled MOVIMOT® inverter



690463243

Information message

Error display

Parameter mode

In the menu "PARAMETER MODE", you can check and change parameter settings

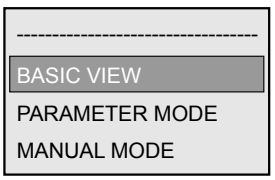
INFORMATION

Parameters can only be changed if

- a Drive ID module is plugged into the MOVIMOT® inverter
- and no additional function is activated.

To change parameters in the parameter mode, proceed as follows:

1. Use the (≡) key to call up the context menu. The second menu item is "PARAMETER MODE".



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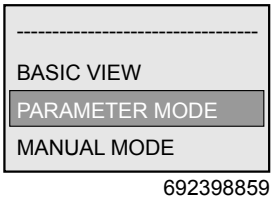
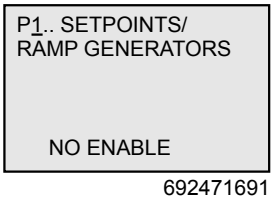
2. Press the (↓) key to select "PARAMETER MODE".



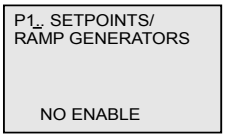
692398859

3. Press the (OK) key to select "PARAMETER MODE". The first display parameter P000 "SPEED" appears.
   Use the (↑) or (↓) key to select main parameter groups 0 – 9.



692471691

4. Press the OK key to activate the parameter subgroup selection in the required main parameter group. The flashing cursor moves one position to the right.



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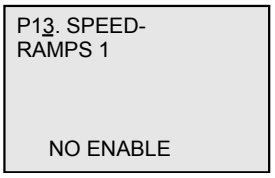
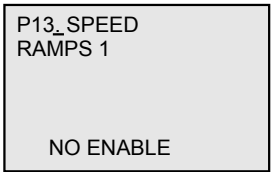
5. Use the ↑ or ↓ key to select the desired parameter subgroup. The flashing cursor is positioned under the number of the parameter subgroup.



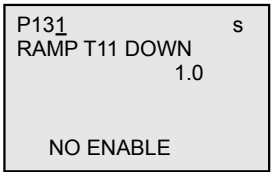
692632203

6. Press the OK key to activate the parameter selection in the required parameter subgroup. The flashing cursor moves one position to the right.



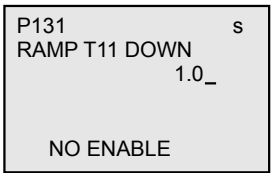
692708875

7. Use the ↑ or ↓ key to select the desired parameter. The flashing cursor is positioned under the third digit of the parameter number.



692797707

8. Use the OK key to activate the setting mode for the selected parameter. The cursor is positioned under the parameter value.



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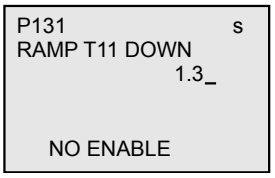
9. Use the ↑ or ↓ key to set the required parameter value.



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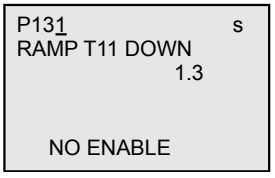
10. Press the OK key to confirm the setting. To exit the setting mode, press the → key. The flashing cursor is positioned under the third digit of the parameter number again.



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11. Use the ↑ or ↓ key to select another parameter, or press the DEL key to switch to the menu of the parameter subgroups.

12. Use the ↑ or ↓ key to select another parameter subgroup or press the DEL key to switch to the menu of the main parameter groups.

13. Use the ☰ key to return to the context menu.

Manual mode

Activation

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

When deactivating the manual mode, the binary signals (binary control) or the process data of the master (control via RS-485) become active. If the enable signal is present via the binary signals or the process data, the MOVIMOT® drive can start up unintentionally when deactivating manual operation.

Severe or fatal injuries.

- Before deactivating the manual mode, set the binary signals or the process data in such way that the MOVIMOT® drive is not enabled.
- Change the binary signals or process data only after deactivating manual operation.

Proceed as follows to change to manual mode:

1. Use the (≡) key to switch to the context menu.
2. Use the (↑) or (↓) key to select "MANUAL MODE".
   Press the (OK →) key to confirm your selection.

The keypad is now in manual operation mode.

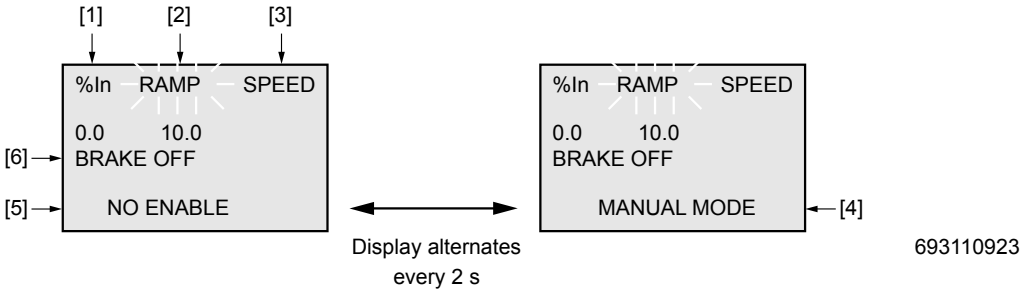
INFORMATION

You can not change to manual mode

- While the drive is enabled
- Or the brake is released.

In this case, the message "NOTE 17: INV. ENABLED" appears for 2 seconds and the DBG keypad returns to the context menu.

Display in manual mode



[1] Output current in [%] of I_N
[2] Acceleration (speed ramps in [s] in relation to a setpoint step change of 50 Hz)
[3] Speed in [rpm]
[4] Manual operation display
[5] Inverter state
[6] Brake status

Operation

The following MOVIMOT® functions can be executed in the menu "MANUAL MODE":

Setting the ramp time	Press the OK key. Use the ↑ or ↓ key to set the required ramp time. Press the OK key to confirm your entry.
Changing parameters	Use the ❯ key to switch between parameters "RAMP", "SPEED" and "BRAKE". Go to the "SPEED" parameter. The keypad shows the currently set "SPEED" parameter as flashing.
Enter speed	Enter the required speed for manual operation using the digit keys <0> to <9>. The sign determines the direction of rotation of the drive. Press the OK key to confirm your entry.
Starting the drive	Use the RUN key to start the MOVIMOT® drive. During operation, the keypad displays the current motor current in [%] of the nominal motor current I_N.
Stopping the drive	Use the STOP key to stop the MOVIMOT® drive.
Releasing the brake without drive enable	Press the ❯ key to switch to the "BRAKE" menu item. Use the ↑ key or the ↓ key to release or engage the brake without drive enable. Press the OK key to confirm your selection.
Reset error	If an error occurs during manual operation, the display shows the following message:

MANUAL MODE <OK> = RESET <DEL> = EXIT ERROR CODE	⟷	MANUAL MODE <OK> = RESET <DEL> = EXIT ERROR TEXT

Display alternates every 2 s

Press the OK key to have the DBG keypad reset the error.

During the error reset, the following message is displayed:

```
MANUAL MODE
PLEASE WAIT...
```

Manual mode remains active after error reset. The display shows the manual mode display again.

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

When deactivating the manual mode, the binary signals (binary control) or the process data of the master (control via RS-485) become active. If the enable signal is present via the binary signals or the process data, the MOVIMOT® drive can start up unintentionally when deactivating manual operation.

Severe or fatal injuries.

- Before deactivating the manual mode, set the binary signals or the process data in such way that the MOVIMOT® drive is not enabled.
- Change the binary signals or process data only after deactivating manual operation.

Deactivating manual mode

Use the (≡) or (DEL) key to deactivate the manual mode.

The following query appears:

```
ACTIVATE
AUTOMATIC MODE ?

DEL=NO        OK=YES
```

- Press the (DEL) key to return to manual mode.
- Press the (OK) key to deactivate manual mode.
  The context menu appears.

Copy function of the DBG keypad

You can use the DBG keypad to copy the complete parameter set from one MOVIMOT® inverter to other MOVIMOT® inverters as follows:

Parameters can only be transferred between two identical MOVIMOT® drives (same inverter and same motor).

1. In the context menu, select the menu item "COPY TO DBG". Press the (OK) key to confirm your selection.
2. After the copying process, connect the DBG keypad to another MOVIMOT® inverter.
3. In the context menu, select the menu item "COPY TO MM". Press the (OK) key to confirm your selection.

10 Service

10.1 Status and error display

10.1.1 Meaning of the status LED

The status LED is located on the top of the MOVIMOT® inverter.

The three-color status LED indicates the operating and error states of the MOVIMOT® inverter.

LED color	LED status	Error code/unit status	Description
–	Off	Not ready	No 24 V power supply
Yellow	Flashes steadily	Not ready	Self-test phase active or 24 V power supply present but supply voltage not OK
Yellow	Flashing evenly, fast	Ready	Releasing the brake without drive enable active (only with S2/2 = "ON")
Yellow	Steady light	Ready but unit inhibited	24 V power supply and supply voltage OK, but no enable signal If the drive does not run when enable signal is present - check startup
Yellow	2x flashing, break	Ready, but manual mode without unit enable	24 V power supply and supply voltage OK Stop manual mode to activate automatic mode
Green/ yellow	Flashing with alternating colors	Ready but timeout	Faulty communication with cyclical data exchange
Green	Steady light	Unit enabled	Motor in operation
Green	Flashing evenly, fast	Current limit active	Drive operating at current limit
Green	Flashes steadily	Ready	Standstill current function active
Red	2x flashing, break	Error 07	DC link voltage too high
Red	Flashing slowly	Error 08	Speed monitoring error (only with S2/4 = "ON") or additional function 13 is active
		Error 09	Startup error Additional functions 4, 5, 12 (DIP switches S2/5 – S2/8) are not permitted
		Error 15	24 V supply error
		Faults 17-24, 37	CPU error
		Error 25, 94	EEPROM error
		Error 38, 45	Unit/motor data error
		Error 44	Current limit exceeded for more than 500 ms (only with additional function 2)
		Error 90	Incorrect motor/inverter assignment
		Error 97	Error while transmitting a parameter set
Red	3x flashing, break	Error 01	Overcurrent in output stage
		Error 11	Overtemperature in output stage
Red	4x flashing, break	Error 84	Overload in motor
Red	5x flashing, break	Error 4	Brake chopper error
		Error 89	Overtemperature in brake Assignment of motor to frequency inverter incorrect

LED color	LED status	Error code/unit status	Description
Red	6x flashing, break	Error 06	Mains phase failure
		Error 81	Start condition[1)]
		Error 82	Output phases interrupted[1)]

1) Only in hoist applications

Status LED flash codes

Flashing steadily:	LED 600 ms on, 600 ms off
Flashing evenly, fast:	LED 100 ms on, 300 ms off
Flashing with alternating colors:	LED 600 ms green, 600 ms yellow
N x flashing, pause:	LED N x (600 ms red, 300 ms off), then LED off for 1 s

10.1.2 Error list

The following table helps you with troubleshooting:

Error	Cause	Solution
Communication timeout (motor stops, without error code)	Missing connection ⊥ RS+, RS- between MOVIMOT® and RS-485 master.	Check and establish connection, especially earth.
	EMC influence	Check shielding of data lines and improve, if necessary.
	Incorrect type (cyclical) for acyclical data traffic, protocol period between the individual messages is longer than the set timeout interval.	Check the number of MOVIMOT® drives connected to the master. If the timeout interval is 1 s, for example, you can connect a maximum of 8 MOVIMOT® drives as slaves for cyclical communication. Reduce message cycle, increase timeout interval, or select message type "acyclic".
DC link voltage too low, supply system off was detected (motor stops, without error code)	Supply voltage not present.	Check supply system leads, supply voltage and 24 V electronics supply voltage for interruption.
	24 V electronics supply voltage not OK.	Check the 24 V electronics supply voltage Permitted voltage: DC 24 V ± 25%, EN 61131-2, residual ripple max. 13%)
	Motor restarts automatically as soon as the voltage reaches normal values.	
Error code 01 **Overcurrent in output stage**	Short circuit on inverter output	Check the connection between the inverter output and the motor as well as the motor winding for short circuits. Reset the error by switching off the DC 24 V supply voltage or resetting the error.
Error code 04 **Brake chopper**	Overcurrent in brake output, resistor damaged, resistance too low	Check the connection of the resistor/replace it.
Error code 06 **Phase failure** (The error can only be detected when the drive is under load)	Phase failure	Check the supply system cable for phase failure. Reset the error by switching off the DC 24 V supply voltage or resetting the error.

Error	Cause	Solution
Error code 07 **DC link voltage too high**	Ramp time too short.	Extend the ramp time Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	Faulty connection between brake coil/braking resistor	Check the braking resistor/brake coil connection. Correct, if necessary. Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	Incorrect internal resistance of brake coil/braking resistor	Check internal resistance of brake coil/braking resistor (see chapter "Technical Data"). Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	Thermal overload in braking resistor, wrong size of braking resistor selected.	Dimension the braking resistor correctly. Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	Invalid voltage range of supply input voltage	Check supply input voltage for permitted voltage range. Reset the error by switching off the DC 24 V supply voltage or resetting the error.
Error code 08 **Speed monitoring**	Speed deviation due to operation at the current limit	Reduce the load on the drive Reset the error by switching off the DC 24 V supply voltage or resetting the error.
Error code 09 **Startup**	Improper Drive ID module for MOVIMOT® with 230 V supply	Only the yellow, green, red, and beige Drive ID modules are permitted for MOVIMOT® with 230 V supply, see chapter "Drive ID module assignment" Check/correct the Drive ID module.
	Incorrect startup selection MOVMOT® with AS-Interface, old firmware combined with AS-Interface	Startup MOVIMOT® with firmware version ≥ 15.
Error code 11 **Thermal overload of the output stage or internal unit error**	Heat sink is dirty.	Clean the heat sink. Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	Ambient temperature too high.	Lower ambient temperature Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	Heat accumulation at the MOVIMOT® drive.	Prevent heat build-up Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	Drive load too high.	Reduce the load on the drive Reset the error by switching off the DC 24 V supply voltage or resetting the error.
Error code 15 **24 V monitoring**	Voltage dip in the 24 V supply	Check the 24 V supply. Reset the error by switching on the 24 V supply voltage.
Error codes 17 to 24, 37 **CPU error**	CPU error	Reset the error by switching off the DC 24 V supply voltage or resetting the error.
Error code 25 **EEPROM error**	Error while accessing EEPROM	Set parameter *P802* to "Delivery state". Reset the error and parameterize the MOVIMOT® inverter again. Consult the SEW Service if the error reoccurs.
Error code 26 **External terminal**	No external signal at terminal X6: 9,10	Correct/reset external error.
Error code 38		Contact SEW Service.

Error	Cause	Solution
Error code 43 **communication timeout**	Communication timeout during cyclical communication via RS-485. If this error occurs, the drive is decelerated and stopped along the set ramp.	Check/establish communication link between RS-485 master and the MOVIMOT® inverter.
		Check the number of slaves connected to the RS-485 master. If the timeout interval of the MOVIMOT® inverter is set to 1 s, you can connect a maximum of 8 MOVIMOT® inverters (slaves) to the RS-485 master for cyclical communication.
	Notice! The drive is enabled again after communication has been re-established.	
Error code 44 **Current limit exceeded**	The set current limit was exceeded for more than 500 ms. This error is only active with additional function 2. The status LED flashes red.	Reduce load or increase current limit at switch f2 (only with additional function 2).
Error code 81 **Start condition error**	The motor could not be supplied with the correct amount of current during the pre-magnetizing time. Rated motor power too small in relation to nominal inverter power.	Check connection between MOVIMOT® inverter and motor.
Error code 82 **Output open error**	2 or all output phases interrupted.	Check connection between MOVIMOT® inverter and motor.
	Rated motor power too small in relation to nominal inverter power.	
Error code 84 **Thermal overload of motor**	When the MOVIMOT® inverter is installed close to the motor, motor protection active.	Set DIP switch S1/5 to "ON". Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	The power section is set incorrectly for the combination of MOVIMOT® inverter and motor.	Check the setting of DIP switch S1/6. Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	Ambient temperature too high.	Lower ambient temperature Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	Heat accumulation at the MOVIMOT® drive.	Prevent heat build-up Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	Motor load too high.	Reduce the load on the motor. Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	Speed too low.	Increase speed. Reset the error by switching off the 24 V power supply or via error reset.
	If the error is signaled just after the first enable signal.	Check the combination of motor and MOVIMOT® inverter. Reset the error by switching off the DC 24 V supply voltage or resetting the error.
	The temperature monitoring in the motor (TH winding thermostat) has tripped when using a MOVIMOT® inverter with the selected extra function 5.	Reduce the load on the motor. Reset the error by switching off the DC 24 V supply voltage or resetting the error.
Error code 90 **Output stage detection**	The inverter/motor combination is not permitted.	Check/correct the settings of DIP switches S1/6 and S2/1.
		Check/correct the connection type of the motor.
		Check whether the DIM module fits the motor and is plugged in correctly.
		Use a MOVIMOT® inverter or motor with another power rating.

Error	Cause	Solution
Error code 91 **Communication timeout bus module – MOVIMOT®**	Timeout between the fieldbus interface and the MOVIMOT® inverter.	Check/re-establish the communication link between the fieldbus interface and the MOVIMOT® inverter. The fieldbus interface reports the error only to the higher-level controller.
Error code 94 **EEPROM checksum error**	Defective EEPROM	Contact SEW Service.
Error code 97 **Copy error**	DBG keypad or PC disconnected during the copy process.	Before acknowledging the error, load the factory setting or the complete data record from the DBG keypad or the MOVITOOLS® MotionStudio software.
	Switching the 24 V supply voltage off and on during the copying process.	

10.2 Inspection/maintenance

10.2.1 MOVIMOT® inverter

The MOVIMOT® inverter does not require any maintenance work. SEW-EURODRIVE does not prescribe any inspection or maintenance work for the MOVIMOT® inverter.

Exception: In case of long-term storage, observe the notes in chapter "Service" / "Extended storage".

10.2.2 Motor

The motor requires regular inspection and maintenance work.

Observe the notes and instructions in chapter "Inspection/Maintenance" of the motor operating instructions.

10.2.3 Gear unit (only for MOVIMOT® gearmotors)

The gear unit requires regular inspection and maintenance work.

Observe the notes and instructions in chapter "Inspection/Maintenance" of the gear unit operating instructions.

10.3 Diagnostics with MWF11A option

The following table shows the meaning of the error codes of the MWF11A option:

Error code on the display	Meaning	Response when terminal X4/6 = "1"
–	Communication interrupted between MWF11A and inverter.	No response. The error disappears automatically as soon as the communication has been re-established.
E-02	Error while reading the EEPROM.	EEPROM is read again.
E-03	Invalid dataset in EEPROM, or EEPROM is still empty.	Factory settings are restored.
E-04	The error only occurs in 2 PD mode if it was not possible to initialize the ramps in the MOVIMOT® inverter (e.g. incorrect MOVIMOT® firmware).	Ramps are initialized again.
F-XX	MOVIMOT® error XX. The error is described on the previous pages.	The MOVIMOT® inverter is reset.

10.4 Unit replacement

⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.

Severe or fatal injuries.

- De-energize the MOVIMOT® drive using a suitable cut-off device before removing the MOVIMOT® inverter.
- Secure the drive against unintended re-connection to the voltage supply.
- Wait for at least 1 minute before removing the MOVIMOT® inverter.

1. Remove the screws and take off the MOVIMOT® inverter from the connection box.
2. Compare the data on the nameplate of the previous MOVIMOT® inverter with the data on the nameplate of the newMOVIMOT® inverter.

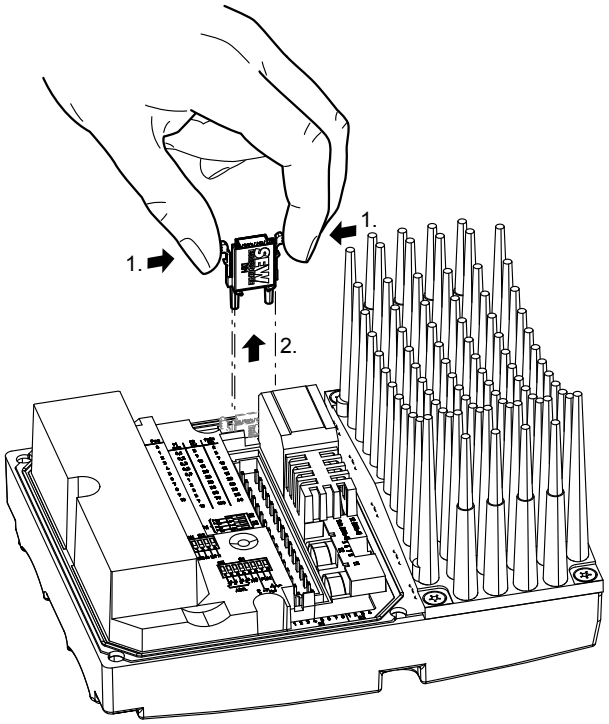
INFORMATION

The previous MOVIMOT® inverter can only be replaced by a MOVIMOT® inverter with the same part number.

3. Set all controls
   - DIP switch S1
   - DIP switch S2
   - Setpoint potentiometer f1
   - Switch f2
   - Switch t1

   on the new MOVIMOT® inverter analogously to the controls of the previous MOVIMOT® inverter.

4. Unlock the Drive ID module of the new MOVIMOT® inverter and pull it out carefully.



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5. Unlock the Drive ID module of the previous MOVIMOT® inverter as well and pull it out carefully.

   Insert this Drive ID module into the new MOVIMOT® inverter.

   Make sure that the Drive ID module locks in place.

6. Place the new MOVIMOT® inverter onto the connection box and screw it on.
7. Supply voltage to the MOVIMOT® inverter.

INFORMATION

When switching on the new inverter the first time after a unit replacement, the 24 V supply must be connected for at least 10 seconds without interruptions.

After the unit replacement, it can take up to 6 s before the MOVIMOT® inverter signals the ready message "K1a" – "K1b" at the relay output.

8. Check whether the new MOVIMOT® inverter is functioning properly.

10.5 Rotating the connection box

We recommend purchasing pre-fabricated MOVIMOT® drive with the correct position of cable entries. In exceptional cases, the position of the cable entries can be rotated to the opposite side (only for units with a modular connection box).

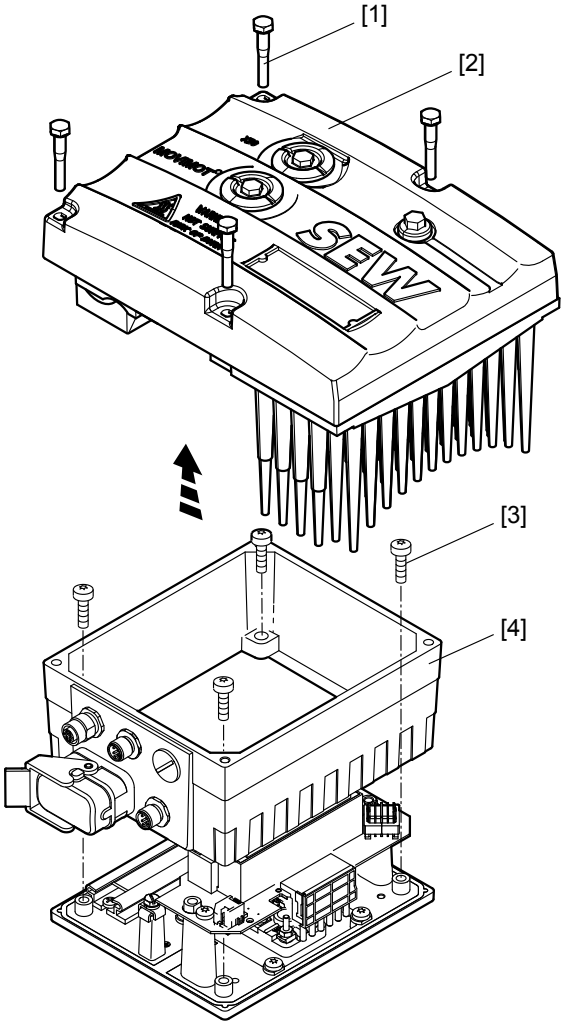
⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.

Severe or fatal injuries.

- De-energize the MOVIMOT® drive using a suitable cut-off device before removing the MOVIMOT® inverter.
- Secure the drive against unintended re-connection to the voltage supply.
- Wait for at least 1 minute before removing the MOVIMOT® inverter.

1. Label the connections of the MOVIMOT® inverter before disconnecting them for later re-installation.
2. Disconnect the supply system, control and sensor connections.
3. Remove the screws [1] and remove the MOVIMOT® inverter [2].
4. Loosen the screws [3] and remove the connection box [4].



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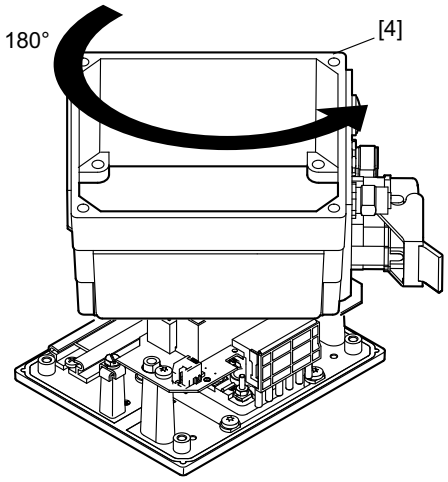
5. Rotate the connection box [4] by 180°.



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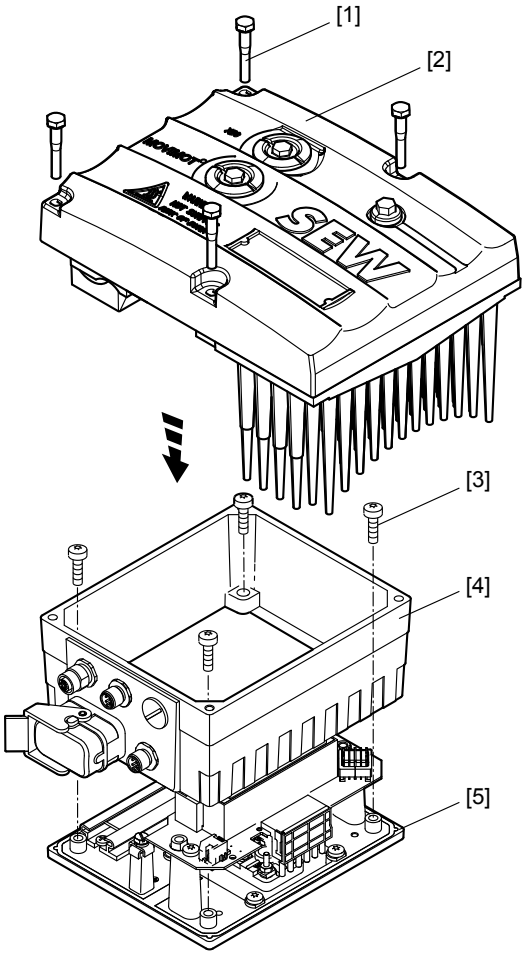
6. Place the connection box [4] on the mounting plate [5] and fasten it with 4 screws [3].
7. Re-install the connections.
8. Place the MOVIMOT® inverter [2] onto the connection box and secure it using 4 screws [1].



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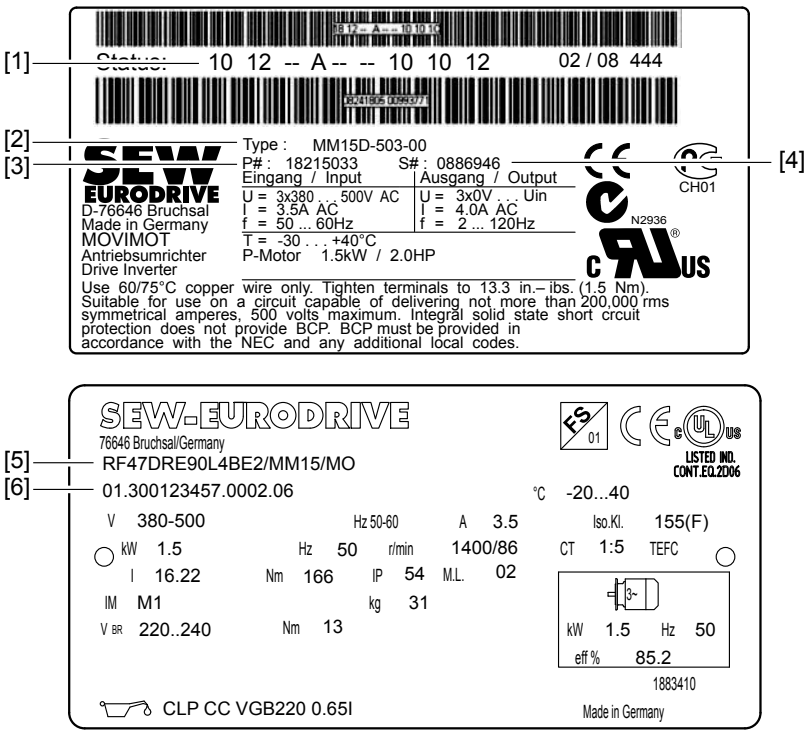
10.6 SEW Service

If a fault cannot be remedied, please contact SEW Service (see "Address List").

Please have the following information at hand when you consult the SEW Service:

- Service code [1]
- Unit designation on inverter nameplate [2]
- Part number [3]
- Serial number [4]
- Type designation on motor nameplate [5]
- Serial number [6]
- Short description of application (application, binary control or via RS-485)
- Nature of the fault
- Accompanying circumstances (e.g. initial startup)
- Your own presumptions as to what has happened, any unusual events preceding the problem, etc.



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10.7 Shut down

To shut down the MOVIMOT® drive, de-energize the drive using appropriate measures.

⚠ WARNING

Electric shock due to charged capacitors

Severe or fatal injuries.

- Observe a minimum switch-off time of 1 minute after disconnecting the power supply.

10.8 Storage

Observe the following instructions when shutting down or storing the MOVIMOT® drive:

- If you shut down and store the MOVIMOT® drive for a longer period, you must close open cable entries and cover contacts with protective caps.
- Make sure that the unit is not subject to mechanical impact during storage.

Observe the notes on storage temperature in the "Technical Data" chapter.

10.9 Extended storage

If the unit is stored for a long time, connect it to the supply system voltage for at least 5 minutes every 2 years. Otherwise, the unit's service life may be reduced.

10.9.1 Procedure when maintenance has been neglected

Electrolytic capacitors are used in the inverters. They are subject to aging effects when de-energized. This effect can damage the capacitors if the unit is connected using the nominal voltage after a longer period of storage.

If you have not performed maintenance regularly, SEW-EURODRIVE recommends that you increase the line voltage slowly up to the maximum voltage. This can be done, for example, by using a variable transformer for which the output voltage has been set according to the following overview. After you have completed the regeneration process, the unit can be used immediately or stored again for an extended period with maintenance.

The following stages are recommended:

AC 400/500 V units:

- Stage 1: AC 0 V to AC 350 V within a few seconds
- Stage 2: AC 350 V for 15 minutes
- Stage 3: AC 420 V for 15 minutes
- Stage 4: AC 500 V for 1 hour

10.10 Disposal

This product consists of:

- Iron
- Aluminum
- Copper
- Plastics
- Electronic components

Dispose of all components in accordance with applicable regulations!

11 Technical Data

11.1 Motor with operating point 400 V / 50 Hz or 400 V / 100 Hz

MOVIMOT® type		MM 03D-503-00	MM 05D-503-00	MM 07D-503-00	MM 11D-503-00	MM 15D-503-00	MM 22D-503-00	MM 30D-503-00	MM 40D-503-00
Part number		**18214991**	**18215009**	**18215017**	**18215025**	**18215033**	**18215041**	**18215068**	**18215076**
		Size 1					**Size 2**		**Size 2L**
Apparent output power at V_{line} = AC 380 – 500 V	S_N	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA	3.8 kVA	5.1 kVA	6.7 kVA
Supply voltages **Permitted range**	V_{line}	AC 3 x 380 V / **400 V** / 415 V / 460 V / 500 V V_{supply} = AC 380 V –10% – AC 500 V +10%							
Line frequency	f_{line}	50 – 60 Hz ±10%							
Nominal line current (at V_{line} = AC 400 V)	I_{line}	AC 1.3 A	AC 1.6 A	AC 1.9 A	AC 2.4 A	AC 3.5 A	AC 5.0 A	AC 6.7 A	AC 7.3 A
Output voltage	V_O	0 – V_{line}							
Output frequency **Resolution** **Operating point**	f_o	2 – 120 Hz 0.01 Hz 400 V at 50 Hz / 100 Hz							
Nominal output current	I_N	AC 1.6 A	AC 2.0 A	AC 2.5 A	AC 3.2 A	AC 4.0 A	AC 5.5 A	AC 7.3 A	AC 8.7 A
Motor power S1	P_{Mot}	**0.37 kW** 0.5 HP	**0.55 kW** 0.75 HP	**0.75 kW** 1.0 HP	**1.1 kW** 1.5 HP	**1.5 kW** 2.0 HP	**2.2 kW** 3.0 HP	**3.0 kW** 4.0 HP	**4.0 kW** 5.4 HP
PWM frequency		4 (factory setting) / 8 / 16 [1]kHz							
Current limitation	I_{max}	Motive: 160 % at ⅄ and △ Regenerative: 160 % at ⅄ and △							
Maximum motor cable length		15 m when the MOVIMOT® inverter is installed close to the motor (with SEW hybrid cable)							
External braking resistor	R_{min}	150 Ω					68 Ω		
Interference immunity		Meets EN 61800-3							
Interference emission		Complies with category C2 according to EN 61800-3 (limit class A to EN 55011 and EN 55014)							
Ambient temperature	ϑ_A	–25 °C (–30 °C) – +40 °C depending on the motor P_N reduction: 3% I_N per K to max. 60 °C							
Climate class		EN 60721-3-3, class 3K3							
Storage temperature[2]		–30 to +85 °C (EN 60721-3-3, class 3K3)							
Maximum permitted vibration and shock load		according to EN 50178							
Degree of protection (depending on the motor)		IP54, IP55, IP65, IP66 (options, specify when ordering) IP67 (only possible for inverter with connection box) (Connection box closed and all cable entries sealed, the degree of protection of the MOVIMOT® drive decreases with a lower degree of protection of the motor)							
Operating mode		S1 (EN 60149-1-1 and 1-3), S3 max. cycle duration 10 minutes							
Cooling type (DIN 41751)		Self-cooling							
Installation altitude		h ≤ 1000 m: No reduction h > 1000 m: I_N reduction by 1% per 100 m h > 2000 m: V_{supply} reduction by AC 6 V per 100 m, overvoltage class 2 according to DIN 0110-1 h_{max} = 4,000 m Also see chapter "Installation altitudes above 1000 m asl" (page 34)							
Weight		See "MOVIMOT® Gearmotors" catalog							
Dimensions, dimension drawings									
Output torque ratings									
Required preventive measures		Ground the unit							

MOVIMOT® type		MM 03D-503-00	MM 05D-503-00	MM 07D-503-00	MM 11D-503-00	MM 15D-503-00	MM 22D-503-00	MM 30D-503-00	MM 40D-503-00
Part number		18214991	18215009	18215017	18215025	18215033	18215041	18215068	18215076
		Size 1					Size 2		Size 2L
External electronics supply	TI. 24 V X6:1,2,3	V = +24 V ± 25 %, EN 61131-2, residual ripple max. 13 % I_E ≤ 250 mA (typically 120 mA at 24 V) Input capacitance 120 µF							
3 binary inputs		Isolated via optocoupler; PLC compatible (EN 61131-2) R_i ≈ 3.0 kΩ , I_E ≈ 10 mA, sampling interval ≤ 5 ms							
Signal level		+13 – +30 V = "1" = Contact closed –3 – +5 V = "0" = Contact open							
Control functions	TI. R ↷ X6:11,12	CW/stop							
	TI. L ↶ X6:9,10	CCW/stop							
	TI. f1/f2 X6:7,8	"0" = setpoint 1 "1" = setpoint 2							
Output relay Contact information	TI. K1a X5:25,26	Response time ≤ 15 ms DC 24 V / 0.6 A / DC 12 to IEC 60947-5-1 (only SELV or PELV circuits)							
	TI. K1b X5:27,28								
Signaling function		NO contact for ready signal Contact closed: – with voltage present (24 V system) – if no fault was detected – after completion of self-testing phase (when unit is turned on)							
Serial interface	TI. RS+ X5:29,30	RS-485							
	TI. RS- X5:31,32								

1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 is set to ON, the units operate at a PWM frequency of 16 kHz (low noise) and switch back in steps to lower switching frequencies depending on the heat sink temperature and the load.

2) If the unit is stored for a long time, connect it to the supply system voltage for at least 5 minutes every 2 years. Otherwise, the unit's service life may be reduced.

11.2 Motor with operating point 460 V / 60 Hz

MOVIMOT® type		MM 03D-503-00	MM 05D-503-00	MM 07D-503-00	MM 11D-503-00	MM 15D-503-00	MM 22D-503-00	MM 30D-503-00	MM 40D-503-00
Part number		18214991	18215009	18215017	18215025	18215033	18215041	18215068	18215076
		Size 1					Size 2		Size 2L
Apparent output power at V_{line} = AC 380 – 500 V	S_N	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA	3.8 kVA	5.1 kVA	6.7 kVA
Supply voltages	V_{line}	AC 3 x 380 V / 400 V / 415 V / **460 V** / 500 V							
Permitted range		V_{supply} = AC 380 V –10 % – AC 500 V +10%							
Line frequency	f_{line}	50 – 60 Hz ±10%							
Nominal line current (at V_{line} = AC 460 V)	I_{line}	AC 1.1 A	AC 1.4 A	AC 1.7 A	AC 2.1 A	AC 3.0 A	AC 4.3 A	AC 5.8 A	AC 6.9 A
Output voltage	V_O	0 – V_{line}							
Output frequency	f_o	2 – 120 Hz							
Resolution		0.01 Hz							
Operating point		460 V at 60 Hz							
Nominal output current	I_N	AC 1.6 A	AC 2.0 A	AC 2.5 A	AC 3.2 A	AC 4.0 A	AC 5.5 A	AC 7.3 A	AC 8.7 A
Motor power	P_{Mot}	**0.37 kW** 0.5 HP	**0.55 kW** 0.75 HP	**0.75 kW** 1.0 HP	**1.1 kW** 1.5 HP	**1.5 kW** 2 HP	**2.2 kW** 3.0 HP	**3.7 kW** 5 HP	**4 kW** 5.4 HP
PWM frequency		4 (factory setting) / 8 / 16 [1]kHz							
Current limitation	I_{max}	Motive: 160 % at ⅄ and △ Regenerative: 160 % at ⅄ and △							
Maximum motor cable length		15 m when the MOVIMOT® inverter is installed close to the motor (with SEW hybrid cable)							
External braking resistor	R_{min}	150 Ω					68 Ω		
Interference immunity		Meets EN 61800–3							
Interference emission		Complies with category C2 according to EN 61800-3 (limit class A to EN 55011 and EN 55014)							
Ambient temperature	ϑ_A	–25 °C (–30 °C) – +40 °C depending on the motor P_N reduction: 3% I_N per K to max. 60 °C							
Climate class		EN 60721-3-3, class 3K3							
Storage temperature[2]		–30 to +85 °C (EN 60721-3-3, class 3K3)							
Maximum permitted vibration and shock load		according to EN 50178							
Degree of protection (depending on the motor)		IP54, IP55, IP65, IP66 (options, specify when ordering) IP67 (only possible for inverter with connection box) (Connection box closed and all cable entries sealed, the degree of protection of the MOVIMOT® drive decreases with a lower degree of protection of the motor)							
Operating mode		S1 (EN 60149-1-1 and 1-3), S3 max. cycle duration 10 minutes							
Cooling type (DIN 41751)		Self-cooling							
Installation altitude		h ≤ 1000 m: No reduction h > 1000 m: I_N reduction by 1% per 100 m h > 2000 m: V_{supply} reduction by AC 6 V per 100 m, overvoltage class 2 according to DIN 0110-1 h_{max} = 4,000 m Also see chapter "Installation altitudes above 1000 m asl" (page 34)							
Weight		See "MOVIMOT® Gearmotors" catalog							
Dimensions, dimension drawings									
Output torque ratings									
Required preventive measures		Ground the unit							

MOVIMOT® type		MM 03D-503-00	MM 05D-503-00	MM 07D-503-00	MM 11D-503-00	MM 15D-503-00	MM 22D-503-00	MM 30D-503-00	MM 40D-503-00
Part number		18214991	18215009	18215017	18215025	18215033	18215041	18215068	18215076
		Size 1					Size 2		Size 2L
External electronics supply	TI. 24 V X6:1,2,3	V = +24 V ± 25 %, EN 61131-2, residual ripple max. 13 % I_E ≤ 250 mA (typically 120 mA at 24 V) Input capacitance 120 µF							
3 binary inputs		Isolated via optocoupler; PLC compatible (EN 61131-2) R_i ≈ 3.0 kΩ , I_E ≈ 10 mA, sampling interval ≤ 5 ms							
Signal level		+13 – +30 V = "1" = Contact closed –3 – +5 V = "0" = Contact open							
Control functions	TI. R ↷ X6:11,12	CW/stop							
	TI. L ↶ X6:9,10	CCW/stop							
	TI. f1/f2 X6:7,8	"0" = setpoint 1 "1" = setpoint 2							
Output relay Contact information	TI. K1a X5:25,26	Response time ≤ 15 ms DC 24 V / 0.6 A / DC 12 to IEC 60947-5-1 (only SELV or PELV circuits)							
	TI. K1b X5:27,28								
Signaling function		NO contact for ready signal Contact closed: – with voltage present (24 V system) – if no fault was detected – after completion of self-testing phase (when unit is turned on)							
Serial interface	TI. RS+ X5:29,30	RS-485							
	TI. RS- X5:31,32								

1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 is set to ON, the units operate at a PWM frequency of 16 kHz (low noise) and switch back in steps to lower switching frequencies depending on the heat sink temperature and the load.

2) If the unit is stored for a long time, connect it to the supply system voltage for at least 5 minutes every 2 years. Otherwise, the unit's service life may be reduced.

11.3 Motor with operating point 230 V / 60 Hz

MOVIMOT® type		MM 03D-233-00	MM 05D-233-00	MM 07D-233-00	MM 11D-233-00	MM 15D-233-00	MM 22D-233-00
Part number		18215084	18215092	18215106	18215114	18215122	18215130
		Size 1			Size 2		
Apparent output power at V_{line} = AC 200 – 240 V	S_N	1.0 kVA	1.3 kVA	1.7 kVA	2.0 kVA	2.9 kVA	3.4 kVA
Supply voltages **Permitted range**	V_{line}	AC 3 x 200 V / **230 V** / 240 V V_{supply} = AC 200 V –10% – AC 240 V +10%					
Line frequency	f_{line}	50 – 60 Hz ±10%					
Nominal line current (at V_{line} = AC 230 V)	I_{line}	AC 1.9 A	AC 2.4 A	AC 3.5 A	AC 5.0 A	AC 6.7 A	AC 7.3 A
Output voltage	V_O	0 – V_{line}					
Output frequency **Resolution** **Operating point**	f_o	2 – 120 Hz 0.01 Hz 230 V at 60 Hz					
Nominal output current	I_N	AC 2.5 A	AC 3.3 A	AC 4.2 A	AC 5.7 A	AC 6.9 A	AC 9.0 A
Motor power S1	P_{Mot}	**0.37 kW** 0.5 HP	**0.55 kW** 0.75 HP	**0.75 kW** 1.0 HP	**1.1 kW** 1.5 HP	**1.5 kW** 2.0 HP	**2.2 kW** 3.0 HP
PWM frequency		4 (factory setting) / 8 / 16 [1]kHz					
Current limitation	I_{max}	Motive: 160 % at ⅄ and △ Regenerative: 160 % at ⅄ and △					
Maximum motor cable length		15 m when MOVIMOT® frequency inverter is installed close to the motor (with SEW hybrid cable)					
External braking resistor	R_{min}	150 Ω			68 Ω		
Interference immunity		Meets EN 61800–3					
Interference emission		Complies with category C2 according to EN 61800-3 (limit class A to EN 55011 and EN 55014)					
Ambient temperature	ϑ_A	–25 °C (–30 °C) – +40 °C depending on the motor P_N reduction: 3% I_N per K to max. 60 °C					
Climate class		EN 60721-3-3, class 3K3					
Storage temperature[2]		–30 to +85 °C (EN 60721-3-3, class 3K3)					
Maximum permitted vibration and shock load		according to EN 50178					
Degree of protection (depending on the motor)		IP54, IP55, IP65, IP66 (options, specify when ordering) IP67 (only possible for inverter with connection box) (Connection box closed and all cable entries sealed, the degree of protection of the MOVIMOT® drive decreases with a lower degree of protection of the motor)					
Operating mode		S1 (EN 60149-1-1 and 1-3), S3 max. cycle duration 10 minutes					
Cooling type (DIN 41751)		Self-cooling					
Installation altitude		h ≤ 1000 m: No reduction h > 1000 m: I_N reduction by 1% per 100 m h > 2000 m: V_{supply} reduction by AC 3 V per 100 m, overvoltage class 2 according to DIN 0110-1 h_{max} = 4,000 m Also see chapter "Installation altitudes above 1000 m asl" (page 34)					
Weight		See "MOVIMOT® Gearmotors" catalog					
Dimensions, dimension drawings							
Output torque ratings							
Required preventive measures		Ground the unit					

MOVIMOT® type		MM 03D-233-00	MM 05D-233-00	MM 07D-233-00	MM 11D-233-00	MM 15D-233-00	MM 22D-233-00
Part number		18215084	18215092	18215106	18215114	18215122	18215130
		Size 1			Size 2		
External electronics supply	Tl. 24 V X6:1,2,3	V = +24 V ± 25 %, EN 61131-2, residual ripple max. 13 % I_E ≤ 250 mA (typically 120 mA at 24 V) Input capacitance 120 µF					
3 binary inputs		Isolated via optocoupler; PLC compatible (EN 61131-2) R_i ≈ 3.0 kΩ , I_E ≈ 10 mA, sampling interval ≤ 5 ms					
Signal level		+13 – +30 V = "1" = Contact closed –3 – +5 V = "0" = Contact open					
Control functions	Tl. R ↷ X6:11,12	CW/stop					
	Tl. L ↶ X6:9,10	CCW/stop					
	Tl. f1/f2 X6:7,8	"0" = setpoint 1 "1" = setpoint 2					
Output relay Contact information	Tl. K1a X5:25,26	Response time ≤ 15 ms DC 24 V / 0.6 A / DC 12 to IEC 60947-5-1 (only SELV or PELV circuits)					
	Tl. K1b X5:27,28						
Signaling function		NO contact for ready signal	Contact closed: – with voltage present (24 V + mains) – if no fault was detected – after completion of self-testing phase (when unit is turned on)				
Serial interface	Tl. RS+ X5:29,30	RS-485					
	Tl. RS- X5:31,32						

1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 is set to ON, the units operate at a PWM frequency of 16 kHz (low noise) and switch back in steps to lower switching frequencies depending on the heat sink temperature and the load.

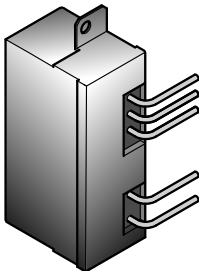
2) If the unit is stored for a long time, connect it to the supply system voltage for at least 5 minutes every 2 years. Otherwise, the unit's service life may be reduced.

11.4 Technical data of options & accessories

11.4.1 MLU11A / MLU21A

Option	MLU11A	MLU21A
Part number	0 823 383 7	0 823 387 X
Function	24 V voltage supply	
Input voltage	AC 380 – 500 V ±10 % (50/60 Hz)	AC 200 – 240 V ±10 % (50/60 Hz)
Output voltage	DC 24 V ± 25%	
Output power	max. 6 W	
Degree of protection	IP65	
Ambient temperature	–25 – +60 °C	
Storage temperature	–25 – +85 °C	

11.4.2 MLU13A



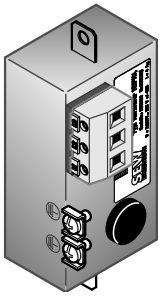
Option	MLU13A
Part number	1 820 596 8
Function	24 V voltage supply
Input voltage	AC 380 – 500 V ±10 % (50/60 Hz)
Output voltage	DC 24 V ± 25%
Output power	max. 8 W
Degree of protection	IP20
Ambient temperature	–25 – +85 °C
Storage temperature	–25 – +85 °C

11.4.3 MLG11A / MLG21A

Option	MLG11A	MLG21A
Part number	0 823 384 5	0 823 388 8
Function	Setpoint generator and 24 V voltage supply	
Input voltage	AC 380 – 500 V ±10 % (50/60 Hz)	AC 200 – 240 V ±10 % (50/60 Hz)
Output voltage	DC 24 V ± 25%	
Output power	max. 6 W	
Setpoint resolution	1 %	
Serial interface[1)]	RS-485 for connecting a MOVIMOT® inverter	
Degree of protection	IP65	
Ambient temperature	–15 – +60 °C	
Storage temperature	–25 – +85 °C	

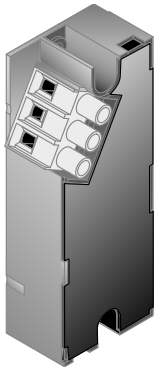
1) with integrated dynamic terminating resistor

11.4.4 MNF21A



Option	MNF21A (only for MM03D-503-00 – MM15D-503-00)
Part number	0 804 265 9
Function	3-phase line filter (allows for category C1 to EN 61800-3)
Input voltage	AC 3 x 380 V ±10 % / 50 – 60 Hz
Input current	4 A
Degree of protection	IP00
Ambient temperature	–25 – +60 °C
Storage temperature	–25 – +85 °C

11.4.5 URM



Option	URM
Part number	0 827 601 3
Function	Voltage relay, ensures quick application of the mechanical brake
Nominal voltage V_N	DC 36 – 167 V (Brake coil AC 88 – 167 V)
Braking current I_N	0.75 A
Degree of protection	IP20
Ambient temperature	–25 – +60 °C
Storage temperature	–25 – +85 °C
Disconnection time t_{off}	about 40 ms (cut-off in the DC circuit)

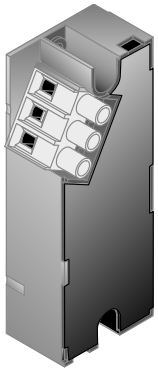
11.4.6 BEM

NOTICE

If the connection voltage is too high, the BEM brake rectifier or the brake coil connected to it can be damaged.

Damage to the BEM brake rectifier or the brake coil.

- Select a brake with a nominal brake voltage that matches the nominal line voltage.



Option	BEM
Part number	0 829 611 1
Function	Brake rectifier
Nominal supply voltage	AC 230 V – AC 500 V +10 % / –15 % 50 – 60 Hz ±5 % Black connection wires
Control voltage	DC 0 – 5 V Red/blue connecting wires
Braking current	max. DC 0.8 A Brake connection 13, 14, 15
Degree of protection	IP20
Ambient temperature	–25 – +60 °C
Storage temperature	–25 – +85 °C

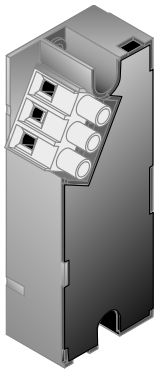
11.4.7 BES (for 24 V brake coil)

NOTICE

If the connection voltage is too high, the BES brake rectifier or the brake coil connected to it can be damaged.

Damage to the BES brake rectifier or the brake coil.

- Select a brake with a 24 V brake coil.



Option	BES
Part number	0 829 847 5
Function	Brake rectifier
Supply voltage V_E	DC 24 V +10 % / –15 %
Control voltage V_{IN}	0: DC 0 – 2 V 1: DC 3 – 7 V
Braking current	max. DC 3.0 A
Degree of protection	IP20
Ambient temperature	–25 – +60 °C
Storage temperature	–25 – +85 °C

11.4.8 MBG11A

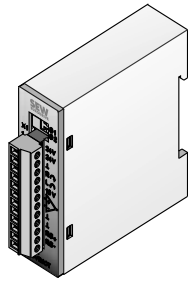
Option	MBG11A
Part number	0 822 547 8
Function	Setpoint control module
Input voltage	DC 24 V ± 25%
Current consumption	About 70 mA
Setpoint resolution	1 %
Serial interface[1)]	RS-485 for connecting max. 31 MOVIMOT® inverters (max. 200 m, 9600 Baud)
Degree of protection	IP65
Ambient temperature	–15 – +60 °C
Storage temperature	–25 – +85 °C

1) With integrated terminating resistor

11.4.9 DBG

Option	DBG60B-01	DBG60B-02	DBG60B-03
Function	Keypad		
Connection	RJ-10 plug for connection to the X50 diagnostics interface		
Degree of protection	IP40 (EN 60529)		
Ambient temperature	0 – +40 °C		
Storage temperature	–20 – +80 °C		

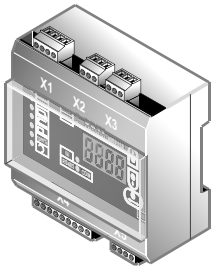
11.4.10 MWA21A



Option	MWA21A
Part number	0 823 006 4
Function	Setpoint converter
Input voltage	DC 24 V ± 25%
Current consumption	About 70 mA
Serial interface[1)]	RS-485 for connecting max. 31 MOVIMOT® inverters (max. 200 m) max. 9600 Baud Unidirectional communication Cycle time: 100 ms
Analog input	0 – 10 V/2 – 10 V, $R_i \approx 12$ kΩ 0 – 20 mA/4 – 20 mA, $R_i \approx 22$ Ω
Setpoint resolution of the analog input	8 bits (± 1 bit)
Signal level binary inputs	+13 – +30 V = "1" – 3 – +5 V = "0"
Degree of protection	IP20
Ambient temperature	–15 – +60 °C
Storage temperature	–25 – +85 °C

1) With integrated terminating resistor

11.4.11 MWF11A



Option	MWF11A
Part number	0 823 827 8
Function	Setpoint converter
Input voltage	DC 24 V ± 25%
Current consumption	About 55 mA
Serial interface	RS-485 to EIA standard, max. 32 stations (with integrated terminating resistor)
Frequency input	100 Hz to 100 kHz Voltage 5.5 – 30 V Square, sine or sawtooth voltage can be used
Analog input Voltage-controlled Current-controlled	 0 – 10 V, $R_i > 200$ kΩ 0 – 20 mA, $R_i = 250$ Ω
Binary inputs Signal level (According to EN 61131-2 type 1)	$R_i = 3$ kΩ, $I_E = 10$ mA 13 – 30 V = "1" 0 – 5 V = "0"
Digital output	PLC-compatible, $I_{max} = 150$ mA
Degree of protection	IP20
Ambient temperature	–10 – +50 °C

11.4.12 Forced cooling fan V

Option	V forced cooling fan				
For motor size DR.	**71**	**80**	**90**	**100**	**112 / 132**
Input voltage	DC 24 V				
Current consumption	0.35 A	0.5 A	0.75 A	0.75/1.1 A	1.64 A
Power demand	10 W	12 W	14 W	14/19 W	29 W
Air discharge rate	60 m^3/h		170 m^3/h	210 m^3/h	295 m^3/h
Connection	Terminal strip				
Max. cable cross section	3 x 1.5 mm^2				
Cable gland	M16 x 1.5				
Degree of protection	IP66				
Ambient temperature	–20 – +60 °C				

11.5 Work done, working air gap and braking torque of the brake

Brake type	Work done until maintenance	Working air gap [mm]		Brake disk [mm]	Braking torque settings				
					Braking torque	Type and number of brake springs		Order numbers for brake springs	
	[10^6 J]	min.[1]	max.	min.	[Nm]	Normal	Blue	Normal	Blue
BE05	120	0.25	0.6	9.0	5.0 3.5 2.5 1.8	2 2 - -	4 2 6 3	0 135 017 X	1 374 137 3
BE1	120	0.25	0.6	9.0	10 7.0 5.0	6 4 2	- 2 4	0 135 017 X	1 374 137 3
BE2	165	0.25	0.6	9.0	20 14 10 7.0	6 2 2 -	- 4 2 4	1 374 024 5	1 374 052 0
BE5	260	0.25	0.9	9.0	55 40 28 20	6 2 2 -	- 4 2 4	1 374 070 9	1 374 071 7
BE11	640	0.3	1.2	10.0	110 80 55 40	6 2 2 -	- 4 2 4	1 374 183 7	1 374 184 7

1) When checking the working air gap, note: Parallelism tolerances on the brake disk may cause deviations of ± 0.15 mm after a test run.

11.6 Braking torque assignment

Motor type	Brake type	Braking torque steps [Nm]												
DR.71	**BE05**	1.8	2.5	3.5	5.0									
	BE1				5.0	7.0	10							
DR.80	**BE05**	1.8	2.5	3.5	5.0									
	BE1				5.0	7.0	10							
	BE2					7.0	10	14	20					
DR.90	**BE1**				5.0	7.0	10							
	BE2					7.0	10	14	20					
	BE5								20	28	40	55		
DR.100	**BE2**					7.0	10	14	20					
	BE5								20	28	40	55		
DR.112	**BE5**									28	40	55		
	BE11										40	55		
DR.132	**BE5**									28	40	55		
	BE11										40	55	80	110

Preferred brake voltage

MOVIMOT® type		Preferred brake voltage
MOVIMOT® MM..D-503, size 1	(MM03.. to MM15..).	230 V
MOVIMOT® MM..D-503, size 2	(MM22.. to MM40..)	120 V
MOVIMOT® MM..D-233[1], size 1 and 2	(MM03.. to MM40..)	

1) In connection with MOVIMOT® MM..D-233, only the brakes with a nominal voltage of 120 V are permitted.

11.7 Integrated RS-485 interface

RS-485 interface	
Standard	RS-485 to EIA standard (with integrated dynamic terminating resistor)
Baud rate	9.6 kBd 31.25 kBd (in connection with MF.., MQ.., MOVIFIT® MC fieldbus interfaces)
Start bits	1 start bit
Stop bits	1 stop bit
Data bits	8 data bits
Parity	1 parity bit, completing for even parity (even parity)
Data direction	Bi-directional
Operating mode	asynchronous, semi-duplex
Timeout interval	1 s
Cable length	max. 200 m in RS-485 operation with 9,600 Baud max. 30 m at transmission rate: 31250 Bd [1]
Number of stations	• Max. 32 stations (1 bus master[2] + 31 MOVIMOT®), broadcast and group addresses possible • 15 MOVIMOT® can be addressed individually

1) Transmission rate of 31,250 Bd will be detected automatically in case of operation with MF.. fieldbus interface.

2) External control or option MBG11A, MWA21A or MLG..A

11.8 Diagnostics interface

Diagnostic interface X50	
Standard	RS-485 to EIA standard (with integrated dynamic terminating resistor)
Baud rate	9.6 kBd
Start bits	1 start bit
Stop bits	1 stop bit
Data bits	8 data bits
Parity	1 parity bit, completing for even parity (even parity)
Data direction	Bi-directional
Operating mode	asynchronous, semi-duplex
Connection	RJ10 socket

11.9 Assignment of internal braking resistors

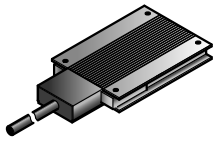
MOVIMOT® type	Braking resistor	Part number
MM03D-503-00 – MM15D-503-00 MM03D-233-00 – MM07D-233-00	BW1	0 822 897 3[1]
MM22D-503-00 – MM40D-503-00 MM11D-233-00 – MM22D-233-00	BW2	0 823 136 2[1]

1) Two screws M4 x 8, included in scope of delivery

11.10 Assignment of external braking resistors

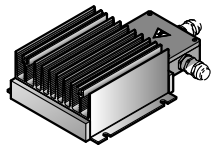
MOVIMOT® type	Braking resistor	Part number	Protective grid
MM03D-503-00 – MM15D-503-00 MM03D-233-00 – MM07D-233-00	BW200-003/K-1.5	0 828 291 9	0 813 152 X
	BW200-005/K-1.5	0 828 283 8	–
	BW150-010	0 802 285 2	–
MM22D-503-00 – MM40D-503-00 MM11D-233-00 – MM22D-233-00	BW100-003/K-1.5	0 828 293 5	0 813 152 X
	BW100-005/K-1.5	0 828 286 2	–
	BW068-010	0 802 287 9	–
	BW068-020	0 802 286 0	–

11.10.1 BW100.. BW200..



	BW100-003/ K -1.5	BW100-005/ K -1.5	BW200-003/ K -1.5	BW200-005/ K -1.5
Part number	0 828 293 5	0 828 286 2	0 828 291 9	0 828 283 8
Function	Dissipating the regenerative energy			
Degree of protection	IP65			
Resistance	100 Ω	100 Ω	200 Ω	200 Ω
Power in S1, 100% cdf	100 W	200 W	100 W	200 W
Dimensions W x H x D	146 x 15 x 80 mm	252 x 15 x 80 mm	146 x 15 x 80 mm	252 x 15 x 80 mm
Cable length	1.5 m			

11.10.2 BW150.. BW068..



	BW150-010	BW068-010	BW068-020
Part number	0 802 285 2	0 802 287 9	0 802 286 0
Function	Dissipating the regenerative energy		
Degree of protection	IP66		
Resistance	150 Ω	68 Ω	68 Ω
Power according to UL in S1, 100% cdf	600 W	600 W	1200 W
Power according to CE in S1, 100% cdf	900 W	900 W	1800 W
Dimensions W x H x D	260 x 75 x 174 mm	260 x 75 x 174 mm	610 x 75 x 174 mm
Max. cable length	15 m		

11.11 Resistance and assignment of the brake coil

Brake	Resistance of the brake coil[1]		
	120 V	230 V	400 V
BE05	78 Ω	312 Ω	985 Ω
BE1	78 Ω	312 Ω	985 Ω
BE2	58 Ω	232 Ω	732 Ω
BE5	51 Ω	200 Ω	640 Ω
BE11	33 Ω	130 Ω	412 Ω

1) Nominal value measured between the red connection (terminal 13) and the blue connection (terminal 15) at 20°C, temperature-dependent fluctuations in the range –25 % +40 % are possible.

11.12 Assignment of the Drive-ID module

Motor			Drive-ID module		
Type	Line voltage [V]	Line frequency [Hz]	Labeling	ID color	Part number
DRS	230 / 400	50	DRS/400/50	White	1 821 437 1
DRE	230 / 400	50	DRE/400/50	Orange	1 821 439 8
DRS	266 / 460	60	DRS/460/60	Yellow	1 821 440 1
DRE	266 / 460	60	DRE/460/60	Green	1 821 442 8
DRS / DRE	220 / 380	60	DRS/DRE/380/60	Red	1 823 493 3
DRS / DRE	220 – 240 / 380 – 415 254 – 277 / 440 – 480	50 60	DRS/DRE50/60	violet	1 821 444 4
DRP	230 / 400	50	DRP/230/400	Brown	1 821 790 7
DRP	266 / 460	60	DRP/266/460	Beige	1 821 791 5

12 Declaration of Conformity

EC Declaration of Conformity

900030010

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal

declares under sole responsibility that the

frequency inverters of the series	**MOVIMOT® D**	
possibly in connection with	**AC motor**	
are in conformity with		
Machinery Directive	**2006/42/EC**	**1)**
Low Voltage Directive	**2006/95/EC**	
EMC Directive	**2004/108/EC**	**4)**
applied harmonized standards	**EN 13849-1:2008**	**5)**
	EN 61800-5-2: 2007	**5)**
	EN 60034-1:2004	
	EN 61800-5-1:2007	
	EN 60664-1:2003	
	EN 61800-3:2007	

1) These products are intended for installation in machines. Startup is prohibited until it has been established that the machinery into which these products are to be incorporated complies with the provisions of the aforementioned Machinery Directive.

4) According to the EMC Directive, the listed products are not independently operable products. EMC assessment is only possible after these products have been integrated in an overall system. The assessment was verified for a typical system constellation, but not for the individual product.

5) All safety-relevant requirements of the product-specific documentation (operating instructions, manual, etc.) must be met over the entire product life cycle.

Bruchsal	11.12.09	Johann Soder	
Place	Date	Managing Director Technology	a) b)

a) Authorized representative for issuing this declaration on behalf of the manufacturer
b) Authorized representative for compiling the technical documents

2309606923

13 Address List

Germany			
Headquarters **Production** **Sales**	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str.10 D-76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Service Competence Center	**Central**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte@sew-eurodrive.de
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	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-elektronik@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357
	Additional addresses for service in Germany provided on request!		

France			
Production **Sales** **Service**	**Haguenau**	SEW-USOCOME 48-54 route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocome.com sew@usocome.com
Production	**Forbach**	SEW-USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
Assembly **Sales** **Service**	**Bordeaux**	SEW-USOCOME Parc d'activités de Magellan 62 avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Nantes	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles F-44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20

France			
	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
	Additional addresses for service in France provided on request!		

Algeria			
Sales	**Alger**	REDUCOM Sarl 16, rue des Frères Zaghnoune Bellevue 16200 El Harrach Alger	Tel. +213 21 8214-91 Fax +213 21 8222-84 info@reducom-dz.com http://www.reducom-dz.com

Argentina			
Assembly **Sales** **Service**	**Buenos Aires**	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar

Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au

Austria			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at

Belarus			
Sales	**Minsk**	SEW-EURODRIVE BY RybalkoStr. 26 BY-220033 Minsk	Tel.+375 17 298 47 56 / 298 47 58 Fax +375 17 298 47 54 http://www.sew.by sales@sew.by

Belgium			
Assembly **Sales** **Service**	**Brussels**	**SEW Caron-Vector** Research park Haasrode Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	**Industrial Gears**	**SEW Caron-Vector** Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be
	Antwerp	**SEW Caron-Vector** Glasstraat, 19 BE-2170 Merksem	Tel. +32 3 64 19 333 Fax +32 3 64 19 336 http://www.sew-eurodrive.be service-antwerpen@sew-eurodrive.be

Brazil			
Production **Sales** **Service**	**Sao Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 152 - Rodovia Presidente Dutra Km 208 Guarulhos - 07251-250 - SP SAT - SEW ATENDE - 0800 7700496	Tel. +55 11 2489-9133 Fax +55 11 2480-3328 http://www.sew-eurodrive.com.br sew@sew.com.br

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@mail.bg

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 33 431137 Fax +237 33 431137 electrojemba@yahoo.fr

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.watson@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Lasalle, PQ H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
	Additional addresses for service in Canada provided on request!		

Chile			
Assembly **Sales** **Service**	**Santiago de Chile**	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 info@sew-eurodrive.cn http://www.sew-eurodrive.com.cn
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn

China			
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
	Additional addresses for service in China provided on request!		

Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. Zeleni dol 10 HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr

Czech Republic			
Sales	**Prague**	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Lužná 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 255 709 601 Fax +420 220 121 237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Copenhagen**	SEW-EURODRIVEA/S Geminivej 28-30 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Egypt			
Sales **Service**	**Cairo**	Copam Egypt for Engineering & Agencies 33 El Hegaz ST, Heliopolis, Cairo	Tel. +20 2 22566-299 + 1 23143088 Fax +20 2 22594-757 http://www.copam-egypt.com/ copam@datum.com.eg

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Reti tee 4 EE-75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Production **Assembly**	**Karkkila**	SEW Industrial Gears Oy Valurinkatu 6, PL 8 FI-03600 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 sew@sew.fi http://www.sew-eurodrive.fi

Gabon			
Sales	**Libreville**	ESG Electro Services Gabun Feu Rouge Lalala 1889 Libreville Gabun	Tel. +241 741059 Fax +241 741059 esg_services@yahoo.fr

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 Normanton, West-Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk

Greece			
Sales **Service**	**Athens**	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr

Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 office@sew-eurodrive.hu

India			
Registered Office **Assembly** **Sales** **Service**	**Vadodara**	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200, +91 265 2831086 Fax +91 265 3045300, +91 265 2831087 http://www.seweurodriveindia.com sales@seweurodriveindia.com subodh.ladwa@seweurodriveindia.com
Assembly **Sales** **Service**	**Chennai**	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 c.v.shivkumar@seweurodriveindia.com

Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 info@alperton.ie http://www.alperton.ie

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il

Italy			
Assembly **Sales** **Service**	**Solaro**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Société industrielle & commerciale pour l'Afrique 165, Boulevard de Marseille 26 BP 1115 Abidjan 26	Tel. +225 21 25 79 44 Fax +225 21 25 88 28 sicamot@aviso.ci

Japan			
Assembly **Sales** **Service**	**Iwata**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373855 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp

Kazakhstan			
Sales	**Almaty**	ТОО "СЕВ-ЕВРОДРАЙВ" пр.Райымбека, 348 050061 г. Алматы Республика Казахстан	Тел. +7 (727) 334 1880 Факс +7 (727) 334 1881 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.com info@alas-kuul.com

Lebanon			
Sales	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
Jordan Kuwait Saudi Arabia Syria	**Beirut**	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 info@medrives.com http://www.medrives.com

Lithuania			
Sales	**Alytus**	UAB Irseva Statybininku 106C LT-63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brussels**	**SEW Caron-Vector** Research park Haasrode Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be

Malaysia			
Assembly **Sales** **Service**	**Johore**	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my

Mexico			
Assembly **Sales** **Service**	**Quéretaro**	SEW-EURODRIVE MEXICO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Quéretaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

Morocco			
Sales	**Casablanca**	Afit Route D'El Jadida KM 14 RP8 Province de Nouaceur Commune Rurale de Bouskoura MA 20300 Casablanca	Tel. +212 522633700 Fax +212 522621588 fatima.haquiq@premium.net.ma http://www.groupe-premium.com

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu

New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no

Pakistan			
Sales	**Karachi**	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 676 53 00 Fax +48 42 676 53 45 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	24 Hour Service		Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucharest**	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly **Sales** **Service**	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 36 195220 St. Petersburg Russia	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 senemeca@sentoo.sn http://www.senemeca.com

Serbia			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SCG-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com

Slovakia			
Sales	**Bratislava**	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-831 06 Bratislava	Tel. +421 2 33595 202 Fax +421 2 33595 200 sew@sew-eurodrive.sk http://www.sew-eurodrive.sk
	Žilina	SEW-Eurodrive SK s.r.o. Industry Park - PChZ ulica M.R.Štefánika 71 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-974 11 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 SK-040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za info@sew.co.za

South Africa			
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 cfoster@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaco Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za

South Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270	Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442 00 Fax +46 36 3442 80 http://www.sew-eurodrive.se jonkoping@sew.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch

Thailand			
Assembly **Sales** **Service**	**Chonburi**	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 / 4419164 Fax +90 216 3055867 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr

Ukraine			
Sales **Service**	**Dnepropetrovsk**	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

United Arab Emirates			
Sales **Service**	**Sharjah**	Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah	Tel. +971 6 5578-488 Fax +971 6 5578-499 copam_me@eim.ae

USA			
Production **Assembly** **Sales** **Service** **Corporate Offices**	**Southeast Region**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manufacturing +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**Northeast Region**	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

Venezuela			
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